



# Open Schools for Open Societies

**Deliverable 3.1**

**Support Mechanism**



Funded by the Horizon 2020  
Framework Programme of the  
European Union

This project has received funding from the European Union's Horizon 2020 Framework Programme under grant agreement No. 741572

### Document Control Page

<b>WP/Task</b>	WP3 / T3.1
<b>Title</b>	Support Mechanism
<b>Due date</b>	31/03/2018 (According to the DoA)
<b>Submission date</b>	30/11/2017
<b>Abstract</b>	The objective of this document is to describe the support mechanism that will provide substance to the participating schools and their communities in all aspects of the open schooling approach. This mechanism will be based on the presentation of techniques on how schools can make use of OSOS approach and its tools to create projects and activities adapted to school specific needs.
<b>Author(s)</b>	Lucas, S., Oliveira, I., Oliveira, G.
<b>Contributor(s)</b>	Praça, G., Milopoulos, G., Zygouritsas, N
<b>Reviewer(s)</b>	Verboon, F., Sotiriou, S.
<b>Dissemination level</b>	<input type="checkbox"/> internal <input checked="" type="checkbox"/> public <input type="checkbox"/> confidential

### Document Control Page

Version	Date	Modified by	Comments
1	3/11/2017	Lucas, S., Oliveira, I., Oliveira, G.	First version of content structure
2	24/11/2017	Lucas, S., Oliveira, I., Oliveira, G.	Content update, ToC update based on comments received from EA
3	29/11/2017	Lucas, S., Oliveira, I., Oliveira, G., Milopoulos, G.	Pre-final version based on comments received from ESHA
4	30/11/2017	Lucas, S., Oliveira, I., Oliveira, G., Milopoulos, G., Zygouritsas, N	Final version



## Executive summary

This document was developed under the framework of WP3 (Open Schooling Hubs Support Mechanism) and its main objective is to describe the Support Mechanism that will help the participating schools and their communities in all aspects of the open schooling approach. The Support Mechanism is based on the presentation of techniques on how schools can make use of the OSOS approach and its tools to create projects and activities adapted to school specific needs.

This document includes 5 chapters.

Chapter 1 addresses the importance of community-based learning, with a reflection that starts with IBSE (Inquiry-Based Science Education) as a strategy to promote students' autonomy and critical thinking in the learning process, passes by the importance of taking students outside the school walls, as a way to involve students in a more engaging learning process, and ends in the need of engaging students in identifying and solving problems within the community.

Chapter 2 defines the Open Schooling Hub as a strategy to engage students in a meaningful, real-world learning process. The different approaches to be followed in the OSOS project, considering the different school contexts, are also described in this chapter. The different roles of the stakeholders that can be involved in a community-based learning approach are also highlighted in this chapter.

Chapter 3 discusses the importance of the Support Mechanism, as it encourages and facilitates the work of the different actors in the Open Schooling Hub, from headmasters, teachers and students, to different stakeholders within the community. This chapter also describes the different tools that are being developed under the Support Mechanism: assessment tool, school development plan, community building and authoring tools, advanced search mechanisms and training academies. This chapter also reflects on the importance of not leaving any school behind, irrespectively of its level of openness, and describes four different approaches to be applied, considering four different levels of school openness to society.

Chapter 4 focuses on supporting openness in action, by describing the courses that are being developed to help teachers, headmasters and parents, in the process of opening the school to the community and engaging students in a community-based, real world problem-solving, learning approach. This chapter includes the description of five different courses that intend to respond to the different needs and levels of openness of the schools. The training activities that compose each course are also described in this chapter.

Chapter 5 wraps-up the main outcomes of the support mechanism highlighting the importance of the community-based learning and the need of placing students in the center of the learning process.



## Table of contents

Executive summary .....	3
Table of contents .....	4
1 Community Based Learning .....	7
1.1 Inquired-Based Science Education (IBSE) .....	7
1.2 IBSE beyond school walls .....	8
1.3 Involving the community in the learning process.....	8
2 Open Schooling Hub.....	10
2.1 Definition of the Open Schooling Hub and different approaches .....	10
2.2 Different actors and roles within the Open Schooling Hub .....	11
3 Support mechanism .....	15
3.1 Support mechanism definition and community building .....	15
3.2 OSOS Self-Reflection Tool .....	17
3.3 Open School Development Plan .....	17
3.4 Community Building Tools .....	17
3.5 Advanced Search Mechanism .....	17
3.6 Educational design and authoring tools .....	17
3.7 Teacher Professional Development .....	18
3.8 Different schools – Different strategies.....	18
3.8.1 Innovation & openness for beginners: From ordinary procedures to the School Development Plan.....	19
3.8.2 From Essential Change to Acceleration - Introducing innovation to competent schools	20
3.8.3 From Innovative Schools to RRI Learning Commons.....	21
3.8.4 Reinventing schools: forward looking scenarios and future classrooms.....	21
4 Supporting School Openness in Action .....	23
4.1 OSOS Support Framework .....	23
4.2 Supporting materials in the OSOS Platform.....	26
4.2.1 Experimental Activities .....	26
4.2.2 Engaging Initiatives .....	26
4.2.3 Educational Library.....	26
4.2.4 OSOS Project Documentation .....	26
4.3 OSOS Academy.....	27
4.3.1 Course I: Community-based learning (headmasters and teachers) .....	28
4.3.2 Course II: Participatory exercises with young people (headmasters and teachers) .....	32
4.3.3 Course III: Introducing innovation in your school (teachers) .....	37



4.3.4	Course IV - Introducing RRI in Schools (headmasters and teachers).....	40
4.3.5	Course V: Engaging with Families (headmasters, teachers and parents associations) .	43
4.4	OSOS support activities.....	45
4.4.1	Workshops and events.....	45
4.4.2	Summer schools .....	46
4.4.3	Contests.....	47
5	Conclusions .....	48
6	References.....	49



**Table of Figures**

Figure 1: Depending on the community needs, different actors/stakeholders that can play an important role by working together towards a common goal. Stakeholder’s involvement contributes also to the mutual learning process, a stronger connection to the community ..... 13

Figure 2: The OSOS Support Mechanism..... 15



# 1 Community Based Learning

*As you stroll down the halls of your neighbourhood school at nine o'clock on a Wednesday morning, you notice that something is different. Many of the classrooms are empty; the students are not in their places with bright, shiny faces. Where are they? In the town woodlot, a forester teaches tenth graders to determine which trees should be marked for an upcoming thinning project. Downtown, a group of middle school students are collecting water samples in an urban stream to determine if there's enough dissolved oxygen to support reintroduced trout. Out through the windows, you can see children sitting on benches writing poems. Down the way, a group of students works with a landscape architect and the math teacher to create a map that will be used to plan the schoolyard garden. Here's a classroom with students. In it, eighth graders are working with second graders to teach them about the history of the local Cambodian community. In the cafeteria, the city solid-waste manager is consulting with a group of fifth graders and the school lunch staff to help them design the recycling and composting program. Students' bright shiny faces are in diverse places in their schoolyards and communities, learning in a whole new way.*

*David Sobel, 2005, Place-based education: Connecting classrooms and communities*

## 1.1 Inquired-Based Science Education (IBSE)

One of the great challenges of science education is related to the existing gaps between what is learned in schools and the real world, with students not realizing the relevance of science to their daily lives (Lyons 2006; Osborne and Dillon 2008).

One of the most interesting approaches to help filling this gap is the Inquiry-Based Science Education (IBSE) methodology, which emphasizes curiosity and observation, followed by problem solving and experimentation (Barrow 2006; Rocard et al. 2007). Through the use of critical thinking and reflection, students are able to make meaning out of gathered evidence (Engeln et al. 2013; Rocard et al. 2007). By promoting learning through inquiry, the IBSE methodology improves students' understanding, participation and motivation in relation to scientific activities, contributing in this way to a general interest in learning (Osborne and Dillon 2008). Through engaging in the processes of scientific inquiry, students are able to acquire a general understanding of the importance of science, the nature of scientific investigation and the evaluation and interpretation of evidence (Osborne and Dillon 2008; Osborne 2013; Kapelari 2015).

In the last decades, different discussions and policy documents both in North America and Europe have helped to define inquiry in terms of what it means for teaching and learning (Barrow 2006; Duschl and Grandy 2008). Five steps were described and advised to be followed, in accordance with the 5E instructional model (Barrow 2006; Bybee 2009):

- **Engage:** Students are motivated to raise questions and formulate hypotheses on a scientific topic.
- **Explore:** Students collect evidences in real contexts to answer the raised questions.
- **Explain:** Students develop explanations for the raised questions, based on the collected evidences.
- **Extend:** Students develop deeper and broader understanding and conduct additional activities.
- **Evaluate:** Students reflect on their findings, and include alternative explanations that reflect scientific understanding.

As a whole, students are encouraged to form, reframe, and improve questions as they gather information and adjust their thinking in response. The value of these features is not to be used as a checklist, but as a guide to the science learning process (Bell et al. 2010).



## 1.2 IBSE beyond school walls

In order to improve students' contact with the real world, IBSE methodology makes use of educational approaches that are developed beyond the school walls, in LOtC (Learning Outside the Classroom Manifesto 2006; SEEF Good Practice Guide 2011) spaces.

These spaces enhance science education by linking students to problems and challenges that are part of their daily lives, in which they have to deep in using their own skills. Moreover, students increase their personal achievement standards, motivation, and positive attitudes toward the environment (Rocard et al. 2007; King and Dillon 2012; Dillon 2015).

In resume, IBSE should go beyond school walls to:

- Develop skills and independence in a widening range of environments;
- Make learning more engaging and relevant to young people;
- Develop active citizens and stewards of the environment;
- Reduce behavior problems and improve attendance;
- Stimulate, inspire and improve motivation;
- Develop the ability to deal with uncertainty.

## 1.3 Involving the community in the learning process

Not only the pedagogical methodology is important to spark students' interest throughout the learning process, but also the curricula contents should not be neglected. The scientific contents of the school curriculum should focus not only on the importance of the thematic knowledge but also on how the curriculum serve (or does not serve) the daily life problems society faces. Community-based, or place-based, education makes use of the local community and environment as a starting point to teach any subject across the curriculum, helping students to develop strong ties to the community and to create a commitment to act as active citizens (Sobel 2005).

Students are engaged in projects that require them to apply their knowledge and skills to solve problems that affect the entire community, helping in this way to cultivate their civic participation. Moreover, the community provides not only the context for learning, as students focuses on community needs and interests, but its members work as partners in every aspect of teaching and learning (Melaville et al. 2006).

Community-based education enhances academic learning through the connection to places that offer the opportunity to learn deeply and in an interdisciplinary manner (Wyner 2013), creating a bridge between the classroom and students' lives, making learning meaningful (Smith and Sobel 2010).

It is of fundamental importance that schools are not seen as some kind of object that has landed in the middle of a community with whom they don't identify themselves nor have anything in common.

Teachers must be encouraged to take students beyond the school walls and go into the community, where they can engage with problems and challenges that are part of their daily lives, and that require them to apply their knowledge and skills, helping in this way to cultivate their civic participation, with a community to which they belong.

According to Melaville et al. (2006), there are five core characteristics common to all community-based education strategies:

- **Meaningful content:** Learning occurs in places and focuses on issues that have meaning for students.
- **Voice and choice:** Learning tasks are active and allow students to take an active role in decision making.
- **Personal and public purpose:** Learning goals connect personal achievement to public purpose.
- **Assessment and feedback:** Conducting ongoing assessment gives students the opportunity to learn from their successes and failures.



- **Resources and relationships:** Community partnerships increase the resources and relationships available for students' learning and action.

By fostering students' interest in their own communities, these strategies sow the seeds of lifelong learning. When students see themselves as active citizens, they take responsibility for what happens to their neighborhoods, communities, and country (Melaville et al. 2006).



## 2 Open Schooling Hub

Today science is increasingly framed in terms of economic growth, social impacts, environmental challenges and global needs. Informal science education promoted by various initiatives is shaped and has been contributing to this trend. Formal science education however needs to develop ways to mainstream this vision through teaching practices and learning objectives. Links between formal and informal education must be developed, in order to develop networks that foster sharing of knowledge, life-long learning, innovations and co-creation of better solutions should form an integral part of quality science education.

An Open Schooling Hub, and through the OSOS activities all OSOS schools, recognizes that building community partnerships will be relevant to develop innovative and open learning and promote a better understanding of science and the role that it plays in society and for the society.

### 2.1 Definition of the Open Schooling Hub and different approaches

**An Open Schooling Hub is an open, questioning, welcoming, democratic environment that supports the development of innovative and creative projects and educational activities. It is an environment that facilitates the process for envisioning, managing and monitoring change in school settings by providing a simple and flexible framework, so that school leaders and teachers can innovate in ways appropriate for schools' local needs.**

It will provide innovative ways to explore the world, to inspire, to engage, and to connect. It will provide a powerful framework for school leaders to engage, discuss and explore: how schools need to evolve, transform and reinvent; how schools will facilitate open, more effective and efficient co-design, co-creation, and use of educational content (both from formal and informal providers), tools and services for personalized learning and teaching; how schools can become innovation incubators and accelerators.

Becoming an Open Schooling Hub demands rethinking not only the pedagogy but also the structure and culture of the learning processes, the way to interact with stakeholders and policy makers to benefit the school projects and curricula.

Schools have much to gain by fostering connections between formal, non-formal and informal learning organizations.

Underperformance in schools is often related to the fact that science content in school does not connect to the real world, with students not being able to recognize its relevance for everyday life (Lyons 2006; Osborne and Dillon 2008). European countries have been making a major effort to improve science education in order to promote a positive attitude towards science, to improve science teaching in schools and to increase students' interest in scientific subjects (European Commission Report 2011).

Pedagogical approaches in schools have been slowly changing, for instance, through the application of the Inquiry-Based Science Education (IBSE) method, which indorses students' curiosity and observation, followed by problem solving and experimentation (Barrow 2006; Engeln et al. 2013). In order to enhance students' experience in real contexts, IBSE makes use of educational approaches such as the Learning Outside the Classroom (LOtC). LOtC spaces improve the experimental teaching of sciences by developing critical thinking and a strong collaborative spirit in the exploration and active resolution of problems, further contributing to an increase in the standards of personal achievement, motivation and improvement of attitudes towards the environment and society (Rickinson et al. 2004; Rocard et al. 2007; King and Dillon 2012; Dillon 2015).

Many teachers are stepping out of the classroom to encourage real world learning and self-discovery, and the benefit extends far beyond school. Creativity, activity, service experiences and projects give students the opportunity to think global but act local, making a real difference in their communities. Community engagement projects allow for students to learn in highly effective ways while helping a



community address its needs – while students learn from the community, the community benefits/learns from the student’s service. Students found these projects highly engaging because they are conducting work that is meaningful, to them and their families or communities.

Learning begins with a problem to be solved, and the problem is posed in such a way that children need to gain new knowledge before they can solve it. Rather than seeking a single correct answer, children interpret the problem, gather needed information, identify possible solutions, evaluate options and present conclusions. Student growth can be extensive, whether it is through improved critical thinking and problem solving skills, greater personal efficacy and leadership development, or enhanced social responsibility and career opportunities (Melaville *et al.* 2006; (Wyner 2013).

The Open Schooling Hub in the first phase and all OSOS schools in the following phases, will be designed for the development of multidisciplinary projects capable of addressing community real needs, in order to solve problems. The typology of projects developed by schools will depend on the problems/challenges identified as well as on the school and local community contexts.

Considering national regulation and contexts, different approaches can be considered:

- Open Model – Students will be invited to identify a problem/challenge in their community, and carry out a multidisciplinary project together with stakeholders to find a potential solution.
- Balance Model – Teachers will present to students a list of problems/challenges (or thematic areas depending on the educational contexts) to be chosen as the focus of the multidisciplinary projects.
- Closed Model – Teachers will present the multidisciplinary project to be developed as a solution for a specific problem/challenge in the community.

To support the transformation of the school, enrich school practices and provide them with systematic reflections on the impact of their interventions, a variety of support tools will be available. The OSOS support mechanism (chapter 4) consists in the presentation of a selection of techniques to help schools making use of the OSOS approach and its tools (OSOS incubators and accelerators) to aggregate and create projects and activities customized to the specific local needs of different types of schools (section 4.8) that will be involved in the project, guiding them towards the transformation of the school to Open Schooling Hubs and finally to sustainable innovation ecosystems.

At this stage, OSOS consortium partners are identifying the first 100 schools to be involved in the initial pilot phase to act like Open Schooling Hubs. This core network includes primary and secondary schools, from urban and rural areas, nationwide distributed in 10 European Union member states (Greece, Germany, Italy, France, Ireland, the Netherlands, Spain, Portugal, Finland, Bulgaria) and one associated country (Israel). Each one of these schools will then develop a network of at least 9 additional schools to form a national network of schools where the Open School Culture is introduced. Overall more than 1,000 schools will be involved in the project in two implementation phases.

## **2.2 Different actors and roles within the Open Schooling Hub**

In all areas of learning, schools benefit from collaborating with families and other members of the community. As discussed before, this is particularly important for science education where the purpose is to understand the world around.

According to the RRI principles which occupy a central role in the OSOS approach (DGRI-EC 2015), by working together with non-formal and informal education providers, enterprises, parents and society, encouraging stronger student engagement, discussion, critical thinking and decision making, schools ensure innovation and meaningful learning in real context, presenting themselves as relevant entities for the common well-being.

Therefore, the engagement of different actors through inclusive, participatory procedures, becomes essential in the development of an open schooling culture.



The Open Schooling Hub should include several stakeholders that could lead to a successful school project. The composition is not a set structure and should fulfil the needs of the project. Participation requirements aren't the same for everyone associated with the project. Instead, participation expectations depend on the degree of a project stakeholder's direct or indirect involvement. Because of this, it's vital to a project's successful completion to accurately identify project stakeholders, set participation expectations and communicate accordingly.

Teachers and students must be aware that it is possible to include a person or an organization that can bring new perspective to the project at anytime. However, it is important to consider that stakeholders should be involved in each step of the decision-making process (not only in the final phase), contributing to the success of their involvement. Besides contributing to the multidisciplinary and practical outcome of the project, stakeholder's involvement contributes also to the mutual learning process, a stronger connection to the community and development of a sustainable innovation ecosystem, where all participants contribute and assume responsibilities on the changing process.

A project stakeholder is an individual, department or organization that may be influenced or benefited by the results of a project or have an effect on how the project is carried out. We can consider three main categories of stakeholders:

- stakeholders actively involved in the project;
- individuals or organizations whose interests are influenced or benefited by the finished result;
- actors that exert a degree of influence over the project or project outputs.

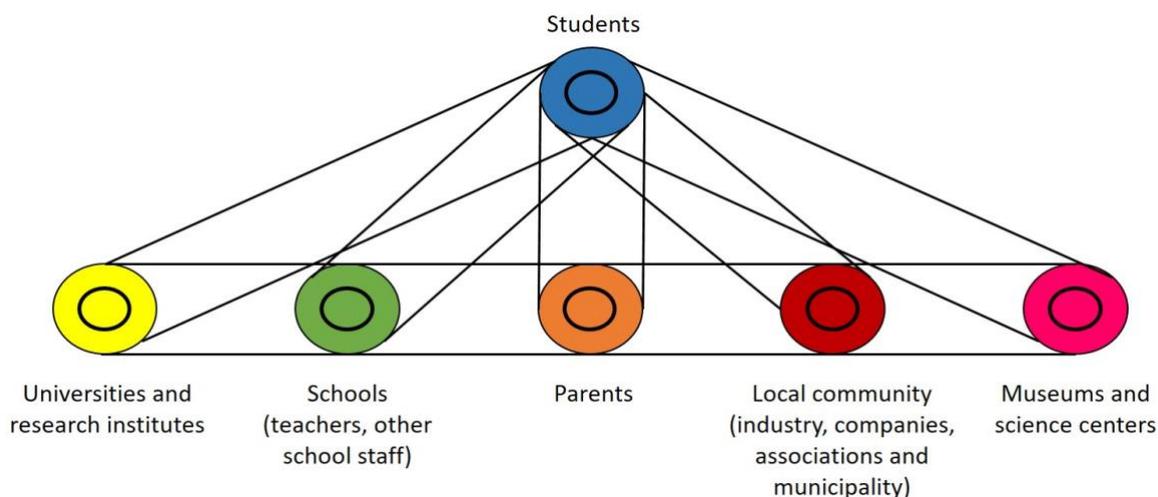
Generally speaking, stakeholders provide information on their areas of interest, identify issues of concern to them, and are able respond to challenges according to their expertise area. However, it is important that all stakeholders are treated equally.

Student-centered learning approaches lead to improvements in student performance (Glowa, J Goodell 2016). Considering a student-centered learning model, and depending on the community needs, different actors/stakeholders can play an important role by working together towards a common goal (Figure 1).

This includes:

- family (e.g. parents association, family nucleus);
- the school community (e.g. teachers, technicians, and other school staff);
- universities and research institutes (e.g. researchers or research managers and innovators);
- museums, science centres and other cultural institutions (e.g. zoological gardens, botanical gardens, planetaria, observatories);
- local communities (e.g. industry, companies, local community and society organizations, municipalities).





**Figure 1: Depending on the community needs, different actors/stakeholders that can play an important role by working together towards a common goal. Stakeholder's involvement contributes also to the mutual learning process, a stronger connection to the community**

Stakeholder identification is important not only for determining who makes sense to involve in a given project's but also for determining the best way to manage their expectations. Every stakeholder, regardless of his level, wants or expects something from the project or its outcome.

Several research studies (LaRocque et al. 2011; Goodall & Montgomery 2014) suggest that effective parental engagement in school is important to motivate students towards science and promote school success. Thus, it is desirable to achieve a higher level of collaboration and commitment with parents, searching for a proactive rather than reactive participation. Moreover, it should be sensitive to the circumstances of all families, recognise the contributions parents can make irrespectively of their socioeconomic status, and aim to empower parents.

Considering the Framework for 21<sup>st</sup> Century Learning (Ananiadou & Claro 2009.), it is desirable that teachers motivate and provide an environment where students can obtain first-hand knowledge with appropriate teacher's support and guidance at each cognitive level. Moreover, science is complex and always changing, and keep up with it it is demanding. Few school teachers feel fully confident in all areas of science which they have to teach but, like the students, they can benefit from initiatives that support sharing their expertise with each other, to have advice from scientists, and ideas about the application of science from those in local industries.

Community-based learning gives young people and teachers structured opportunities and tools for physically exploring their communities and interacting with many kinds of local experts, such as residents, business owners, members of government, artists, and local organizations, among others. Business and industry, as local policy makers (e.g. municipality) may also be indispensable for the development of the projects, contributing with expertise, networking and tools to design and apply science and technology in common projects and to propose innovative solutions to real community challenges.

Cooperation with science museums, science centres, zoological gardens, botanical gardens, planetaria, observatories and science communicators in general, can also promote motivation, access to resources and researchers, and effective learning outcomes - Some of the research relevant to science centers and museums is summarized in a resource developed under the auspices of the UK's Museums, Libraries, and Archives Council (see also Hooper-Greenhill & Moussouri 2003; Hooper-Greenhill 2017).

Accelerators, described at **Deliverable D4.1- Open Schooling Accelerators**, include real examples on how to involve different stakeholders in specific projects. Also, the example of the Bloomfield Science Museum Jerusalem, based on a project developed and led by the American Museum of Natural History

in New York, and already reported in **Deliverable D2.1 – Open Schooling Model**, represents a good example of an innovative collaboration between the public school system and institutions dealing with informal science education. Using the model of project-based learning applied to science fairs, students were able to work in issues concerning the whole community, such as health, environmental and nutritional issues. This program involved the participation of researchers and engineers, teachers, students and parents, local and national government and six other institutions working with non-formal or informal scientific and technological education.

Two other examples are described in order to clarify the importance of identifying and involving a diverse group of key institutions/people in participatory procedures in each step of the decision-making process.

**Example 1:**

To promote healthy eating habits in schools and families is a well-known problem, identified not only by students, but generally recognized both by schools and families. Pavilion of Knowledge Science Centre identified and invited different stakeholders to collaborate in the search for solutions for this challenge. Key stakeholders were represented, including the school community (teachers and students), families (parents association), local companies (food service companies), policy makers (municipality), research community (agronomist, immunologists), and health professionals (doctors, nutritionists, psychologists). By working together, they were able to elaborate and start working on well-defined actions such as: a) designing healthy menus for school canteens; b) developing collaborative workshops for students and families; c) support concrete actions through student groups (communication between peers).

**Example 2:**

A different suggestion concerning the outdoor learning, would be to strength the connection between students and nature during school time. The idea of setting up biodiversity spots (vegetable gardens, bird nests or insects hotels), exploring curricula contents in context (zoology, botany, statistics, meteorology, etc.), or developing activities such as food production or monitoring animal behavior could encourage a higher use of the nature outdoor spaces as part of the teaching process. Besides school community and families, a possible hub structure could be represented by integrating local companies, as garden centres and gardening stores, woodworking shops or hardware stores for technology related activities, the municipality department of green areas, and researchers in the area of botany, agronomy and zoology.

Stakeholder's involvement techniques may vary according to their profile and role in the specific project. Approaches may include collaborative workshops, hands-on activities, participatory debates, public conferences, media, etc. By working with and for the community, involving meaningful actors, encouraging interaction and sharing responsibilities, schools will be able to enrich their practices and professional context. Cooperation within and between schools, universities, science centres and museums, local industry and research institutions, collaborative reflection, development and evaluation of instruction, exchange of ideas, materials and experiences, quality development, cooperation between teachers, students, parents, science communicators, local entrepreneurs and researchers, will promote a better understanding of science and the role that it plays in society and for the society.



### 3 Support mechanism

Learning environments are no longer silent places. They are full of energy and excitement. In many of today’s classrooms, students use technology to collaborate and explore ideas using mobile devices, tablets, laptops or computers or interactive whiteboards. Students are producing evidence of their learning and publishing it on the web. Teachers also are approaching learning with new ideas about what learning looks like in other environments. Many educators are embracing technology in their practice to motivate students but also to help those developing skills to become lifelong learners and leaders.

#### 3.1 Support mechanism definition and community building

Support mechanisms sustenance learning and teaching by communicating evidence of learning progress and providing insights to teachers, school leaders, policy makers, parents, and, most importantly, the learners themselves. Assessment procedures can be embedded within learning activities. For example, the development of inquiry activities in the framework of a school project allows the introduction of methods to analyse the effects of the implementation of such activities fostering complex problem-solving abilities. Projects’ outcomes are powerful ways of improving curriculum for students, teaching practices and for the school as organization.

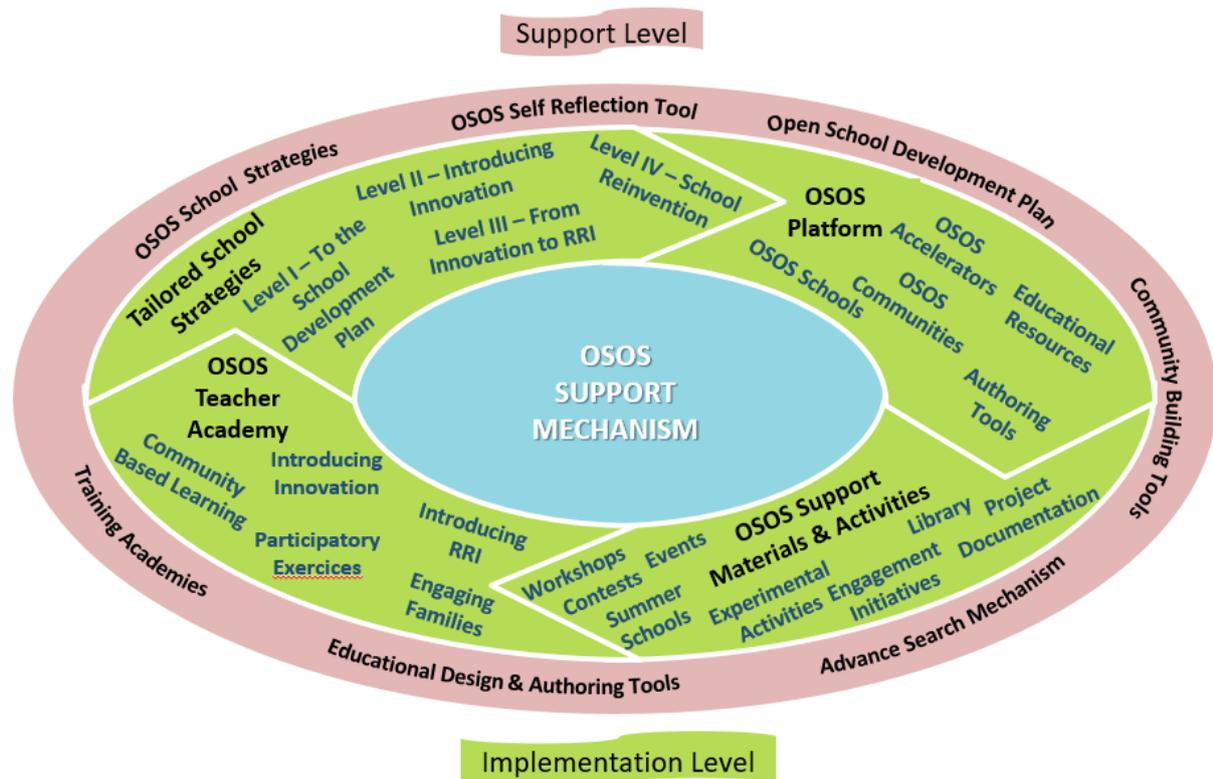


Figure 2: The OSOS Support Mechanism

The support mechanism will facilitate the work of the different stakeholders involved in the process. The process starts with the Change Agents who are becoming Inspiring Leaders of the school community. The OSOS Support Mechanism will offer open, interoperable and personalized solutions meeting the school’s individual needs, supports school leaders capture innovation, to decide on the appropriate strategy to diffuse innovation to the school and through constant reflection is guiding them towards the transformation of the school to Open Schooling Hub and finally to sustainable innovation ecosystems.

With the support of the National Coordinators, the project team will set in place an effective support mechanism which will provide guidance, training, feedback and recommendations to the actors involved (teachers, museum educators, outreach groups, parents). The OSOS approach will facilitate the integration of a “chain reaction” in school innovation and openness by providing the critical mass of innovative practitioners, engage them in communities of practice, support their work with numerous tools that will enrich their practices and provide them with systematic reflections on the impact of their interventions.

The support mechanism will be based on the presentation of techniques on how schools can make use of the OSOS approach (see Table 1) and its tools (incubators and accelerators) to create and develop projects tailored to school specific needs. A set of professional development training activities are designed to support teachers in the implementation of the OSOS approach in classrooms, helping teachers to go the extra mile. In the table below the key components of the Open Schooling Support Mechanism are described.

**Table 1: OSOS approach integrating a “chain reaction”**

	Increase Mass	Increase Density	Increase Temperature	Increase Reflectivity
Stimulation Phase	Teachers Guidelines, School Leaders Toolkit	Community Building Tools, Community Support Mechanism	RRI Tools & Guidelines (Partners Initiatives)	School Profiling (Openness & RRI Culture), School Development Plan
Incubation Phase	OSOS Academy,	Community Building Tools, Community Support Mechanism	OSOS Scenarios of Use (Incubators of Innovation)	School Development Plan (revisited), School Innovation Profile (revisited),
Acceleration Phase	OSOS Academy,	Community Building Tools, Community Support Mechanism	OSOS Accelerators, European Open Schooling Map	School Development Plan (revisited), School Innovation Profile (revisited),

The OSOS tools provided by the support mechanism will spread the RRI principles throughout every school of the OSOS network. The OSOS tools can be categorized in four different but complementary areas according to their impact on the innovation process which is represented as a “chain reaction”:

- Community building tools to “increase the mass” of the innovators;
- Authoring tools to exchange ideas and experiences - “increase density”;
- Innovative scenarios that meet their educational needs - “increase temperature”;
- Access and reflect on their practices and provide guidance for future actions.

The framework for school leaders to engage, discuss and explore provided by OSOS approach sustaining how schools need to evolve, transform and reinvent; how schools need to facilitate a more open and effective environment using educational contents, tools and customized learning services and how schools can become incubators and furthermore accelerators are the aims of OSOS support mechanism.



### 3.2 OSOS Self-Reflection Tool

In the framework of the OSOS project, a **self-reflection tool** will be available for school headmasters to measure the level of openness of the school with a special focus on the introduction of the RRI culture. This self-evaluation instrument will support headmasters in this process of becoming a reinvented school. Each school representative will have access to the assessment tool through OSOS portal together with a set of information and guidelines on how to fill the forms. The impact assessment tool is presented in detailed in **Deliverable D6.2 – Impact Assessment Tools**. The tool is based in three levels concerning the organizational change: management level, process level and teachers' professional development level, described in **Deliverable D6.1 – OSOS Assessment Methodology**.

### 3.3 Open School Development Plan

**An Open School Development Plan** is a strategic document emphasizing school's improvements and responsibilities identifying areas of changes and enhancements aiming to achieve better learning outcomes for students. The document, presented in **Deliverable D2.2 – OSOS Strategies**, represents a process of where schools are and where they want to be in some key areas as professional development, schools as learning ecosystems, gender issues, school external partnerships or effective parental collaboration. It's a self-reflection tool that will support schools in their journey to become Open Schools. To support teachers in using this tool a training activity is presented in OSOS Academy deconstructing the form in a participatory way.

### 3.4 Community Building Tools

The community building tools will support the development of effective cooperation with organizations namely universities and research centres, non-formal learning places (ex. museum and science centres), companies, industries, local communities and schools. These tools will guide teachers to participate in a dynamic way in a collaborative network of school/thematic/national or even international communities. Using these tools teachers and headmasters will be supported in their workspaces in OSOS platform organizing different kind of information and the involvement of different users under their local community. The communities will be guided by the interdisciplinary project which aims to provoke educational changes and can form a unique space for the development of open schooling activities. A detailed description of the Community Building Tools can be found in **Deliverable D3.2 – OSOS Incubators (Section 5.4.3)**.

### 3.5 Advanced Search Mechanism

Besides supporting the network within the Open Schooling Hubs and OSOS Schools, the OSOS platform will also have a digital repository of educational resources targeting contents from a variety of science-related sources. To search for these resources there will be an appropriate mechanism which will filter them according to what is pursuit. The platform will also allow searching for schools involved in similar thematic projects providing tools for teachers to share activities and practices. A detailed description of the Advanced Search Mechanism can be found in **Deliverable D3.2 – OSOS Incubators (Section 5.4.7)**.

### 3.6 Educational design and authoring tools

Effective teaching is providing students with strong educational design that offers opportunities to independently and collaboratively explore and acquire knowledge. Students can apply what is learned to different contexts, in order to demonstrate that the learning outcomes have been achieved. Developing effective educational design requires careful planning and structured thinking in order to maximize students' potential for success. Students learn best when they are actively engaged: when they interact with their peers, teachers and educational resources, when they are reflective and have opportunities to apply this knowledge. Successful design therefore needs to ensure that students are given opportunities to take an active, interactive and reflective role in their studies.



OSOS portal will provide teachers a set of authoring tools allowing them to become developers of educational activities. The portal will have two different authoring environments: one for teachers and other for students. Each OSOS community member will be able to personalize existing online resources and share them with other community members.

The students will also be creators of projects and educational activities which will reflect on their real educational needs of their classrooms as well as providing solutions to their local communities. Students will identify community problems (Feel), envision and develop creative solutions that can be replicated easily (Imagine), implement the project (Create) and finally share their stories with other schools in the community (Share). A detailed description of the Authoring Tools can be found in **Deliverable D3.2 – OSOS Incubators (Section 5.4.4 & 5.4.5)**.

### **3.7 Teacher Professional Development**

*Effective professional development is on-going, includes training, practice and feedback, and provides adequate time and follow-up support. Successful programmes involve teachers in learning activities that are similar to ones they will use with their students, and encourage the development of teachers' learning communities. There is growing interest in developing schools as learning organisations, and in ways for teachers to share their expertise and experience more systematically.*

*Organisation for Economic Co-operation and Development, 2005*

No matter how good pre-service training for teachers is, it cannot be expected to prepare teachers for all challenges they will face throughout their careers. Education systems therefore seek to provide teachers with in-service professional development opportunities.

Professional development can be provided from formal to non-formal in the form of courses, conferences, workshops qualification programme both online and in-site. However, professional development can also occur in informal contexts such as discussions among work colleagues, independent reading and research, observations of a colleague's work, or other learning from a peer. Educators who do not experience effective professional development do not improve their skills, and student learning suffers. Professional development is about life-long learning and growing as an educator. Teachers will always have the potential to progress and refine their teaching skills. There is always more to learn and new skills to accomplish. However, this professional development must be effective enabling educators to develop the knowledge and skills they need to address students' learning challenges.

To be effective, professional development requires thoughtful planning followed by careful implementation with feedback to ensure it responds to educators' learning needs. Educators who participate in programmes must put their new knowledge and skills to work. Professional development is not effective unless it causes teachers to improve their instruction or causes administrators to become better school leaders. OSOS will establish an Open Academy based on its innovative outputs. This Academy will offer a multitude of courses to school leaders, teachers acting as change agents in their schools and teachers with a newly acquired taste for innovative practices from all over Europe.

A detailed description of the initial OSOS Academy is provided in section 4.2 of this document.

### **3.8 Different schools – Different strategies**

It is unquestionable that schools should see themselves as part of a larger community, where students are engaged with its members and take part on the identification and resolution of problems that are common to the entire community. Nevertheless, this is still not a reality for the majority of schools in Europe. Moreover, when schools have already developed projects within the community these are not seen as being part of the school learning routine but as an isolated and (probably) unrepeatable event.



The limitations to school openness are very diverse, and many times are linked to a lack of experience from teachers, as they do not know where to start, how to engage the community members in the learning process and how to take their students outside the school walls to develop projects that are meaningful to all. Other reasons may also be at stake, as the resistance to change and the lack of resources. Irrespectively of these differences among schools concerning their openness to society, no school should be prevented from participating in OSOS project and to follow a path where its level of openness is changing, as well as the complexity of the projects developed and the level of stakeholders' engagement. Even with this multitude of scenarios, the main goal is always the same: to develop Open Schooling Hubs as open, questioning, welcoming and democratic environments that supports the development of innovative and creative projects and educational activities.

In order to achieve this goal, several tools were developed, as an answer to the different needs of schools, concerning their initial openness level. The tools include: i) self-reflection and assessment tools, which identify the school's level of openness and provide evidence for the successful implementation of the openness process; ii) school development plan, to help headmasters and teachers to reflect on the level of openness of their school; iii) community building tools, linking schools with the same goals and strategies through the OSOS platform; iv) advanced search mechanisms, where the OSOS platform will act as a harvester of educational resources from a variety of science-related sources and where users can also search for schools, as well as for thematic communities organized by teachers to share materials and experiences; v) authoring tools, allowing teachers to grow into agents of change in their schools through the creation of original and high quality education content; and vi) training activities, to support teachers in the implementation of the OSOS approach, helping them to go the extra mile.

For more details see [Deliverable D2.2 – OSOS Strategies](#). The following section describes how schools in different levels of openness will be supported to get the best from OSOS approach and its tools.

### **3.8.1 Innovation & openness for beginners: From ordinary procedures to the School Development Plan**

Schools that are at an initial stage in relation to innovation and openness to the community, generally present a higher resistance to change. In these schools, school heads represent an important turning point both encouraging, inspiring, engaging and supporting teachers to collaborate, contributing to school development.

The Self-Reflection Tool and the School Development Plan will act as a self-evaluation and needs-analysis instrument, crucial to identify the school's level of openness, and the areas that need immediate attention. Focus should be given to the need of change and to the added value of OSOS project from the perspective of school heads and teachers, contributing to a higher motivation of students and learning outputs. This record is also a starting point, a reference to plan the activities that will be developed, and the possible network of partners that may support them. It is crucial that schools be willing to participate in the programme and that principals agree to planning and developing activities.

The success of the action starts with the choice to join the programme, the result of an interest in participating rather than the result of an imposition. For this reason, at this initial stage, school heads should consider also to mainly involve active, enthusiastic teachers with low level of resistance to change, likely to influence their more conservative peers. At this stage, headmasters and teachers will feel the need for simple guidelines to stimulate and support them on how to get the best from OSOS approach and its tools. Community building tools and access to a selection of best-practices (Accelerators), described in detail in [Deliverable D4.1 – Open Schooling Accelerators](#), and other support materials are especially relevant, since they will help teachers, step-by step, to improve the quality of learning and introduce innovation. A



A set of courses in the **OSOS Academy**, described in Chapter 4 of this document, will provide teachers and headmasters the opportunity to develop their competences and support them through change. The initial training of these professionals should take place immediately after their selection, emphasizing the methodology of the programme and its management characteristics. CPD “Triggering community-based projects”, will introduce OSOS values to the changing agents and guide them through the first steps. Afterwards, other Training Activities (TA) will be available:

TA 1 from Course I (Presenting Local Accelerators) and TA 2 (School Development Plan - a Participatory Approach), aims to raise awareness on the importance of community-based learning and its impact, and invites teachers and headmasters to reflect on the school openness level, considering the involvement of stakeholders, equitability and learning process.

TA 3 from Course I (Being an Active Teacher) emphasises the critical role of teachers through the process of innovation and aims to give them the tools to act like drivers to engage the school and local community on the learning process.

A special attention is also given to training funding opportunities (TA 4 from Course I) that may largely contribute to spread teacher’s horizons, share ideas and experiences on educational practices with other peers in Europe.

For schools that are just beginning to open to the community, is it expected from them to choose and replicate a previous developed and shared accelerator, considering their own local needs and learning goals. Achievements should be focus in the application of different learning approaches, as Project Based Learning (PBL) and Inquiry-Based Science Education (IBSE) methods. Efforts to involve the local community are also important, giving priority to families and a small number of stakeholders with relevant contribution to the practical outcome of the project. TA 1 from Course III (From hands-on to IBSE activities) will discuss the importance of IBSE to the learning process and student’s motivation, providing the tools to go beyond hands-on activities. TA1 from Course V, about the challenges of parent involvement, will also raise awareness to the important role of effective family engagement and will help teachers to identify strategies to overcome some of the main constrains to their participation.

### **3.8.2 From Essential Change to Acceleration - Introducing innovation to competent schools**

Some schools are already moving towards innovation: they are already interested in student-centred learning approaches, and implementing local projects. However, the involvement of stakeholders is still low, occasional, and school community misses the opportunity to communicate and share with external communities. In these schools, active teachers are easier to identify and mobilize to new projects, however they often work alone. The role of teams is crucial for the success of an open schooling hub and therefore, it is important that they act also as promoters to engage the whole school community. In these cases, the description of the Open School Development Plan is also a way to value a moment of joint creation, since this record is also a starting point, a reference to plan the activities that will be developed and the possible network of partners that may support them. As on the previous group, community building tools will be of extreme importance allowing teachers to establish a closer contact with other members with similar interests, discuss challenges and share ideas. OSOS incubators and accelerators will mainly act as inspirational material, allowing teachers and students to choose and adapt its content to their local community needs and curriculum obligations.

The initial training of teachers from these schools that are already moving towards innovation, should emphasize the benefits of fostering connections between formal, non-formal and informal learning organizations, as well as on the pedagogical approaches of IBSE and Learning Outside the Classroom (LOtC), enhancing students' experience in real contexts. The topics must strengthen the concepts of a culture of peace, participation, youth leadership, community mobilization and local needs.

Course III “Introducing Innovation in your School” will support teachers to design true multidisciplinary IBSE activities and apply them inside and outside school walls. Considering the high importance of



community engagement projects that allow for students to learn and participate in a truly meaningful way, TA 4 from Course III (Going from interested students to active citizens) aims to help teachers finding new strategies to develop short-term projects, linked with school curricula that places students as active citizens within their community.

In order to achieve a higher level of collaboration and commitment with families, Course V “Engaging with families”, aimed for headmasters, teachers and parents’ associations, will explore a set of practical tools to address the major challenges and benefits of this connection. Although based on initial proposed scenarios and accelerators available at OSOS platform, adaptations according to a particular school and local community need, will represent new important insights and recommendations for future practices. At this phase, authoring tools will already allow teachers and students to personalize and become developers of educational activities.

### **3.8.3 From Innovative Schools to RRI Learning Commons**

Schools in this stage are already developing multidisciplinary projects using the community context, and involving of a certain number of external stakeholders, probably committed to the major practical outcomes. They recognize the importance of fostering connections between formal and non-formal learning, and the benefits of PBL, IBSE and LOtC to the learning process, and student’s motivation. Teachers are committed to empower student’s autonomy, critical thinking and problem-solving skills, leadership development, and enhanced social responsibility. However, it is still needed to emphasise on the integration on the RRI culture in the school setting. Projects are often selected by the teachers (instead of the students), stakeholders are chosen as a mean to an end, and there’s a lack of participatory activities.

In order to guide teachers and headmasters through the process, Course IV “Introducing RRI in schools”, will also invite changing agents to reflect on the basic RRI principles (Course IV - TA 1 Self-Reflection Exercise), and to better understand how they can be implement in school projects (Course IV - TA 2 RRI Obstacles and Opportunities Map in our School).

Besides the tools mentioned in the previous sessions (also employed to this school level), more advanced tools and training activities will be required at this level. It is expected from these schools to contribute with new projects and ideas, highlighting social responsibility and innovation by answering to a real local need. Although OSOS incubators and accelerators already developed may act as inspiring material, local challenges should be identified by the students themselves as part of the community. According to the model already described in **Deliverable D2.3 – Open Schooling Roadmap** (Feel, Imagine, Create, and Share), students must identify the problems in their community, involve different stakeholders, develop co-creative solutions in order to solve them and, finally, share their stories. Projects should be Placed, Purposeful, Passion-led and Pervasive, resulting in future accelerators to be updated on the OSOS platform.

As a support, Course II “Participatory exercises with young people” was developed to encourage teachers to use participatory models to identify and discuss issues referring to local contexts, explore matters of concern and interest, as well as possible solutions and suggestions (Course II TA 1 to TA 4). These participatory strategies can also be applied in the involvement of relevant stakeholders through the whole project. Other examples of best practices will also be shared at the OSOS online platform (science cafes, science espressos, play decide...). These schools will easily by in a position to act themselves as an inspiration, fostering connections and supporting other schools to develop similar projects.

### **3.8.4 Reinventing schools: forward looking scenarios and future classrooms**

Schools that have already achieved a high level of openness in their operation and are ready to share their experiences with others, should both contribute, as well as benefit, from the establishment of strong school national and international networks of knowledge and sharing best practices towards common interests and goals. OSOS online communities are particularly important through to



accomplish this purpose. The Open School Profile works also as an instrument to attract national and international collaborations in its areas of interests. By acting as multipliers of the open schooling hub model, and fostering autonomy, they are also contributing to the development of an open schooling culture and sustainability of the whole educational system.

At this level, greater curricular flexibility and equity in the evaluation of different disciplines must be considered. These ideas, including the breakdown of the class as the basic unit of teaching, grouping exercises according to centres of interest, student-centered teaching and the importance of an adequate and contextualized environment are not new.

The concept of an open schooling hub absorbed all these educational trends, rethinking not only the pedagogy but also the structure and culture of the education systems (see section 3.1). The schools answer not only to requirements of the curricula, but also to the needs of local community, centralizing the learning process in the student and its real context.

An interesting model that already reflects this approach is the Big Picture Learning initiative (<http://bigpicture.org>), previously described in greater detail in **Deliverable D2.2 – OSOS Strategies**. However, giving the diverse nature of the education systems in Europe and their different level of autonomy, accepting this model as part of the common education system will involve a close work with local or central governments (e.g. Ministry of Education).

Fostering long-term relationships and international partnerships is difficult to achieve, and supplementary support will be needed to play this crucial role. Support tools will be developed during the course of the project. Continuing education must also be taken in account, highlighting the importance of supporting schools' local teams as a fundamental condition for the development of activities. Mobility proposals to enhance international cooperation should also be considered.

## 4 Supporting School Openness in Action

*Education is not the learning of facts but the training of the mind to think.*

*Albert Einstein*

### 4.1 OSOS Support Framework

Professional development refers to many types of educational experiences related to an individual's work. Teachers and educators in general participate in professional development programs to learn and apply new knowledge and skills that will improve their performance on the job.

In education, research has shown that teaching quality and school leadership are the most important factors in raising student achievement. For teachers and school to be as effective as possible, they continually expand their knowledge and skills to implement the best educational practices. Teachers learn how to help students to reach the highest levels. Many people may not be aware of their local school system's methods for improving teaching and student learning. Professional development is the only strategy school systems have to strengthen teachers' performance levels. Professional development is also the only way educators can learn so that they are able to better their performance and raise student achievement.

When people use the term "professional development," they usually mean a formal process such as a conference, seminar, or workshop; collaborative learning among members of a work team. However, professional development can also occur in non-formal contexts such as discussions among work colleagues, independent reading and research, observations of a colleague's work, or other learning from a peer. Student learning increase when teachers engage in effective professional development focused on the skills educators need in order to address students' major learning challenges.

Great teachers help create great students. In fact, inspiring and informed teacher is the most important school-related factor influencing student achievement, so it is critical to pay close attention to how we train and support both new and experienced teachers.

The focal point of the development of the OSOS Support Mechanism is that teachers are the key in the implementation of the open school culture and the open school approach in school classrooms. Especially when applying project-based learning which is the main pedagogical approach of the open school culture. Teachers need to be supported in order to fulfil their active role in establishing an open school culture in their context. A culture that transforms schools into an engaging environment that makes a vital contribution to its community. Student projects meet real needs in the community outside of school, they are presented publicly, and draw upon local expertise and experience. The school environment fosters learner independence through collaboration, mentoring, and through providing opportunities for learners to understand and interrogate their place in the world.

Teachers need also to be supported in igniting projects that grow from inquiries in order to solve problems. Students find them highly engaging because they are conducting work that is meaningful, to them and their families or communities. Learning begins with a problem to be solved, and the problem is posed in such a way that children need to gain new knowledge before they can solve the problem.

The OSOS Support Mechanism will support school leaders and teachers in establishing openness in their schools and transforming them into innovative ecosystems. Teachers will be supported to collaborate in such environments that will act as shared sites of science learning for which leaders, teachers, students and the local community share responsibility, over which they share authority, and from which they all benefit through the increase of their communities' science capital and the development of responsible citizenship.



It will provide a powerful framework for school leaders to engage, discuss and explore: how schools need to evolve, transform and reinvent; how schools will facilitate open, more effective and efficient co-design, co-creation, and use of educational content (both from formal and informal providers), tools and services for personalized science learning and teaching; how schools can become innovation incubators and accelerators.

According to the Brookings Institution, scaling schooling innovations is an especially wicked challenge because it is a matter of absence over presence. They argue that it is a problem related to the conservative culture of schools that was never ready to support innovative practices and approaches. According to the NMC HORIZON 2015 K-12 Edition Report<sup>1</sup> experts on the topic surmise that these types of innovations often fail because teachers struggle against the odds; their formal education has not prepared them to implement novel instructional approaches, and strong support systems for effective professional development are scarce.

In order for teachers to fully realize the potential of the teaching in the open school approach, it is necessary to provide them with the necessary training and support mechanism that will create the conditions for teachers to undertake this new, challenging role of the proposed approach adequately and assist them in every step of the process.

There are different points that are crucial for the successful application of the open school approach in educational settings:

- Providing effective training on open schooling methods and on the use of the OSOS incubators
- Assisting behavioural change: Apart from their training, in order for teachers to introduce the open school approach into their everyday routine, they need to perform a change in behaviour and adapt a new culture and philosophy.
- Supporting localisation and adaptation: Helping teacher to localise the content and tools provided and to make them fit to the specific needs of each teacher and the students has proven to be very important.

The OSOS Support Mechanism will provide a great opportunity for the professional development of teachers. It will bring together innovative methodology, cutting edge tools and resources, a rich collaborative environment and a strong component of community support coming from national coordinators. However, we must take into account that there are severe constraints that educators face, most prominently:

- Time: Too little time to explore new tools and new trends;
- Curricula: Too dense and extensive curricula that doesn't allow experiments;
- Exams: Too much continuous pressure to prepare students for final exams;
- ICT: Lack of ICT infrastructure and support;
- School: Lack of school support.

The OSOS Support Mechanism activities will have to take these major restrictions into account and design and develop a sustainable support framework that will allow supporting teachers despite their constraints. It must be clear that any support framework cannot fully rely on only one type of support activity alone, but has to simultaneously address various approaches and offer different solutions to reach and help as many teachers in as many countries as possible. In theory, the following all-encompassing framework is designed and developed to answer to the needs and challenges that can offer the best solutions between the possibilities available.

---

<sup>1</sup> NMC Horizon Report: 2015 K-12 Edition © 2015, The New Media Consortium



Table 2: The OSOS Support Framework

ENGAGEMENT ACTIVITIES	TRAINING ACTIVITIES	SUPPORT ACTIVITIES	RECOGNITION ACTIVITIES	COMMUNITY ACTIVITIES
Introduction Workshops	Face to Face Training	Online Support	Certification	Teachers' Communities
Implementation Workshops (Face To Face & Online)	Face to Face Training Online Training (Webinars)	Online Training	Contests	Schools working on common projects
Training Events	Summer Schools	Teachers' Helpdesk & Online Support	Accreditation	Exchanges of practices
	OSOS Academy	OSOS Academy	Digital Badges	Building school and teacher networks

The above table presents the different type of activities which jointly with the courses and the other material constitute the OSOS support framework that altogether represent the OSOS Support Mechanism created to ensure the implementation of the OSOS approach but also the continuation and sustainability of OSOS:

- **Engagement Activities:** These activities provide a series of opportunities to directly engage schools and teachers in the OSOS approach. The main objective of these activities is to create awareness about the existence of the project, to reflect with and to learn from main stakeholders on the issues of open schooling, to support the adaptation/localisation efforts in their specific settings and to provide a sense of ownership and partnership to those teachers that are using and piloting the OSOS approach in their classrooms.
- **Training Activities:** The community of users is composed by those that are making use of the OSOS incubators and accelerators and integrating them in their daily teaching. Training events are a core activity and ensure that teachers have the opportunity to explore the whole OSOS approach and benefit from immediate support coming from the national coordinators and/or from teachers from OSOS hubs that are already proficient on the use of the project proposed methods and tools.
- **Support Activities:** It consists of an efficient online support service that provides teachers with the necessary ongoing support to answer their immediate questions or is available to support the piloting implementation efforts in the classroom or other educational.
- **Recognition Activities:** For many teachers, certification and accreditation are an integral part of their professional development. With this vision in mind, OSOS will investigate how to develop an efficient recognition mechanism that validates the participation of all teachers and eventually recognize their support according to the different levels of commitment.
- **Community Activities:** The size of the community and its level of engagement are the good indicators of the future potential success of the sustainability of the OSOS approach. The necessary mechanisms to support the creation and continuation of the community are the key aspects of this.



The OSOS Support Mechanism will support the school communities during the process through a) numerous participatory engagement activities (provision of guidelines and training, vision building workshops, practice reflection workshops, hangouts and online support) and b) networking opportunities. A devoted social platform will be developed to support the process, to facilitate the sharing of ideas and project and to map the schools' development.

## **4.2 Supporting materials in the OSOS Platform**

The continued growth of open educational materials in online repositories contributes clearly to the trends of sharing and reusing learning materials and also reflects an opportunity to improve the quality of learning. These online platforms inspire the collaborative learning and the creativity. But the reuse of learning materials is also encouraged along with the possibility of customizing educational materials to the learning process and improving them, adding or removing activities or even combining in multiple ways. Despite the potential of digital repositories offering benefits in teaching and learning, there is a need of convince teachers and educators of their usefulness in daily practice while promoting community-based learning. The purpose of such repositories is not only to store catalogued learning materials but make sure that they are distributed within the community. For this share and reuse process is crucial to have meaningful meta-data - information/description of the learning material. Many learning materials repositories provide a platform for sharing them on the web but not all of them provide mechanisms that foster community building dynamics around those resources. This is one the main objectives of OSOS Support Mechanism: is to show to the community how to take the most advantage of online inspirational learning resources. In the framework of the OSOS Support Mechanism there will be four different types of supporting materials: experimental activities most of them related to OSOS courses and related training activities, engaging initiatives with examples of best practices, relevant documents, papers or reports that sustain the existence of the main goals of OSOS project and supporting project documents.

### **4.2.1 Experimental Activities**

Science activities and experiments have a way of bringing out the inner scientist in even the youngest of learners. Even if students are bit young for the laboratory or need an extra motivation they can still learn principles of physics, chemistry or natural sciences through simple homemade science activities and experiments. In this section teachers and students will find challenging and interesting science and experimental activities that will support their school projects. There will also be some practical activities related to OSOS training courses but National Coordinators are also encouraged to share some of their own activities. Teachers running OSOS projects will search, adapt, use and share them on the web.

### **4.2.2 Engaging Initiatives**

Engaged learning is not a new approach. It has been written under several terms such as active learning, or problem-based learning all emphasizing a student-focused learning within a facilitated environment. What is proposed here is a set of engaging initiatives or activities involving different actors in the community as a collection of best practices of what works better for each target namely science cafes, science espressos or Play Decide.

### **4.2.3 Educational Library**

This section will provide access to relevant reports, papers or documents targeted to headmasters, teachers, students, parents or stakeholders

### **4.2.4 OSOS Project Documentation**

The OSOS platform will make available structural project documents such as letters of commitment for teachers and headmasters, a School Development Plan intended for teachers or even a Self-Assessment Guideline to support teachers.



### 4.3 OSOS Academy

Teachers face an increasing number of challenges in their daily work in the classroom and they often struggle to receive the training or support to address these. The OSOS Academy supports teachers to access relevant training opportunities by providing teachers professional development courses (CPD), tools and resources. These courses will be addressed not only to teachers but also to headmasters and parents) and are organized in several different Training Activities according to their specific training needs. **Deliverable D3.2 – OSOS Incubators (Section 6.2.3 & 6.2.4).**

The OSOS Academy will facilitate the development of schools as educational ecosystems at all levels (local, national and European). The academy will build on both formal and informal learning strengths and will offer new ways of thinking about learning and professional development and the impact and opportunities offered by ICT technologies. And it will provide education leaders with a practical framework to develop innovation strategies for their own transformation agendas. The OSOS Academy will provide a complete training program for headmasters and teachers to enable openness in their school.

The courses (presented in the table below) of the OSOS Academy will help participants establish an Open School Culture in their school. An Open School culture imports external ideas that challenge internal views and beliefs and, in turn, exports its students – and their assets – to the community it serves. Such an engaging environment makes a vital contribution to its community: student projects meet real needs in the community outside of school, they are presented publicly, and draw upon local expertise and experience. The school environment fosters learner independence – and interdependence – through collaboration, mentoring, and through providing opportunities for learners to understand and interrogate their place in the world.

**Table 3: OSOS Academy Courses Panorama**

<p style="text-align: center;"><b>Course I: Community Based Learning</b></p> <p>TA1: Presenting Local Accelerators TA2: School Development Plan TA3: Being an Active Teacher TA4: Erasmus+ Funding Opportunities</p>	<p style="text-align: center;"><b>Course II: Participatory Exercises with Young People</b></p> <p>TA1: Participatory Mapping TA2: Participatory Exercise “Targets” TA3: Participatory Exercise “Journeys” TA4: Participatory Exercise “Scale – Pros &amp; Cons”</p>
<p style="text-align: center;"><b>Course III: Introducing Innovation in your School</b></p> <p>TA1: From Hands-On to IBSE Activities TA2: Designing IBSE Activities TA3: Going Beyond School Walls TA4: From Interested Students to Active Citizens</p>	<p style="text-align: center;"><b>Course IV: Introducing RRI in Schools</b></p> <p>TA1: Self-Reflection Exercise TA2: RRI Obstacles &amp; Opportunities Map</p>
	<p style="text-align: center;"><b>Course V: Engaging with Families</b></p> <p>TA1: Parent Involvement Challenges TA2: Getting to Know School Families</p>

Participants will be trained on how to promote openness in their school by:

- By setting up broad and inclusive consultation processes, to build trust and enhance support for changes
- By considering regional or local partnerships to stimulate school development or support the implementation of specific changes



- By creating partnerships between schools and higher education institutions, focused on research, creating collaboration between theory and practice (involving both teacher education providers and faculties of educational science);
- By promoting gender equality (teacher addressing classroom dynamics, teacher debunking students' stereotypes)
- By effectively engaging parents
- By encouraging and supporting collaboration among staff for teaching (e.g. team teaching; sharing of teaching resources) and staff learning
- By considering cross-school networks and digital platforms to support (a culture of) collaboration in the teaching profession
- By supporting a culture of collaboration by avoiding situations that could encourage counterproductive competition between individuals
- By creating opportunities for/encourage/support school staff to engage in school-to-school networks to share expertise and teaching resources, spread innovation or support school development

#### 4.3.1 Course I: Community-based learning (headmasters and teachers)

As the old African proverb says, "It takes a village to raise a child." or it would take a community to raise a school. It's important to work as a community to foster our schools for our community needs. One of the great challenges of science education is how to relate what is learned in schools with the real world. Real education/school transformation denotes authentic community connections and actions. Teaching is more than conveying knowledge. It's an inspiration for the school change. This course is intended to headmasters and teachers.

<b>Course I - Training Activity 1: Presenting Local Accelerators</b>	
<b>Framework</b>	The open schooling accelerators are the best practices that will act as accelerators for the introduction of OSOS approach in the participating schools. They will serve as a driving-force to help innovative schools on how to be inspired and to develop their own innovative ideas to new projects. This pool of cases based on school projects and initiatives from museum and science centres or research centres promote creative problem solving, discovery, learning by doing, experiential learning, critical thinking and creativity and simulating the real scientific work. These resources will be available in OSOS portal.
<b>Aims</b>	<ul style="list-style-type: none"> <li>▪ Raise awareness on the importance of community-based learning and its impact;</li> <li>▪ Reflect on the learning process focused on who is learning and how;</li> <li>▪ Encourage links between schools and the community;</li> <li>▪ Promote the "going beyond the schools walls" strategy.</li> </ul>
<b>Before you start</b>	<p>Time: 1 hour (it can be more depending on the local community projects)</p> <p>Number of participants: 6</p> <p>Space organisation: meeting room set-up</p> <p>Materials: laptop; projector.</p>
<b>Narrative</b>	<ol style="list-style-type: none"> <li>1. Start with a small icebreaking exercise challenging trainees for a peer's presentation with a special emphasis on previous school projects and experiences involving the community or focused only on the project carried out at schools.</li> <li>2. Make a brief presentation about OSOS project, its objectives and outcomes. It's also important to explain the learning impact of community projects within all stakeholders.</li> </ol>



3. Make a virtual tour on OSOS website and portal highlighting existing accelerators as inspirational projects. You should focus on your own local best practices and start a reflection on how it could be important to start a community-based project.
4. At the end of the training activity there should be a compromise from the headmaster about the involvement of the school in OSOS project (see letter of commitment in appendix).

### Course I - Training Activity 2: Open School Development plan – a participatory approach

#### **Framework**

The school development plan is a self-evaluation instrument to assess the level of openness of the school. The idea is to be used to initiate a self-reflection process on where we are now and where do we want to go regarding the development of innovative projects and initiatives, school external collaborations, teachers' professional development and effective parental engagement strategies. The school development plan is a personal tool which will help teachers to go the extra mile.

#### **Aims**

- Raise awareness about the important to reflect on where do teachers want to be in one or two years;
- Assess the level of involvement of stakeholders, parents and other community actors in school projects and initiatives.

#### **Before you start**

Time: 2 hours

Number of participants: up to 20

Space organisation: table distribution in U

Materials:

- A3 or A2 papers with 5 key messages: "Engaging with families", "Innovative learning methodologies", "Gender issues", "Institutional partnerships", "Collaboration with stakeholders";
- A5 papers: one with "where we are now" and the "other where we want to go" under each key message;
- black markers; two different colours of post-its; tape.

#### **Narrative**

1. Start with a small presentation of each participant and moderator.
2. Explain the purpose of the exercise.
3. Give to each teacher two different colours of post-its and a black marker.
4. Ask teachers to think and write individually where they are now and where they want to be in each of the key messages.
5. Choose one key message to start the discussion and ask teachers to come and place the post-it where they are now. The moderator needs to analyse the information and make a sum-up identifying some common points. Then ask teachers to come and share the post-it about where they want to go. The moderator should trigger the discussion using what teachers have written and also finding some synergies between them. It will also be important to allow teachers to share their point of view regarding that specific key message and together discuss possible strategies to overcome some difficulties.
6. Repeat the last point for each of the other key messages.
7. As the Open School Development Plan is essential for the teacher to continue this reflection ask teachers to fill the document the week right after the training activity and challenge them to revisit the plan as many times as they needed.

### Course I - Training Activity 3: Being an Active Teacher



### **Framework**

Teachers play a critical role in engaging the school community, families and the different stakeholders (both local and institutional) in the process of community-based learning. The presence of an active teacher in the centre of the open schooling hub is therefore of extreme importance. This active teacher should be fully aware of the necessity of creating a network that links all stakeholders, at the same time that encourages students to develop their critical thinking and autonomy and finds new approaches to take the school curricula contents closer to students' own reality.

### **Aims**

- To discuss what means to be an active teacher;
- To discuss the importance of having active teachers in the centre of the community-based learning process;
- To help teachers identifying strategies to engage the school community, families, local and institutional stakeholders in the learning process;
- To help teachers identifying strategies to engage students in the learning process, by increasing their autonomy and critical thinking and team work.

### **Before you start**

Time: 3 hours

Number of participants: Up to 10

Space organization: Meeting room with tables distributed in U

Materials: Laptop; Projector; A3 or A2 papers, where teachers will identify community challenges and define strategies to solve them; Black markers; Tape.

### **Narrative**

1. Start with a short presentation of each participant and moderator.
2. Explain the purpose of the training activity.
3. Ask teachers to share with the group how they define an active teacher (1 min each).
4. Discuss with teachers what is a community-based learning project.
5. Ask teachers to individually identify and write in a paper a community challenge/need and relate it with the school curricula.
6. Ask teachers to contextualize and to explain to the group the reasons of their choice.
7. Ask teachers to switch papers among them in order to work on their peer's project.
8. Considering the topic they have in hands, ask teachers to identify possible stakeholders that are able to contribute to the resolution of the community challenge.
9. Ask teachers to define the role and way of involvement of the different stakeholders that were previously identified. Ask them to refer also possible constrains.
10. Promote a discussion among the teachers' groups about the designed strategies.
11. Discuss with teachers the limitation they could have when working as catalysts in a community project.

## **Course I - Training Activity 4: ERASMUS+ Funding Opportunities**

### **Framework**

While each country is responsible for the organisation and content of its education and training systems, there are advantages in working together on issues of shared concern. Through the Erasmus+ program the Commission contributes to European cooperation projects that promote school exchanges.

Education ministers from EU countries have identified the following priority areas:

- All pupils should gain the competences they need, including literacy and numeracy. This will be done through modernising curricula, learning materials and pupil assessment;



- Every pupil should benefit from high-quality learning, including migrant children;
- Pre-school education should be more widely available, support for students with special needs must to be improved within mainstream schooling and early school leaving reduced;
- Teachers, school leaders, and teacher educators should receive more support through effective recruitment and selection and professional education.

The European Commission works also with EU countries to strengthen 'key competences' such as knowledge, skills, and attitudes that will help learners find personal fulfilment and, later in life, find work and take part in society. These key competences include 'traditional' skills such as digital skills communication, literacy, and basic skills in maths and science, as well as horizontal skills such as learning to learn, social and civic responsibility, initiative and entrepreneurship, cultural awareness and creativity.

The approach is to promote key competences by:

- providing high-quality learning for all students based on relevant curricula;
- reducing early school-leaving;
- increasing early childhood education;
- improving support for teachers, school leaders, and teacher educators.

### **Aims**

- Raise awareness on Erasmus+ Education and Training funding opportunity;
- Spread the importance of having training abroad allowing a strength contribution to teacher's professional development;
- Allow teachers to explore new resources, learn new pedagogical approaches and innovative methodologies to use with their students;
- Contribute in depth to a change of education practices in European countries by sharing views, ideas and methodologies.

### **Before you start**

Time: 1 hour

Number of participants: up to 20

Space organisation: table distribution in U

Materials: laptop; projector.

### **Narrative**

1. Start with a small presentation of each participant and moderator and explain the purpose of this training activity.
2. Make a virtual tour on the European Commission Web.
3. Organisations wanting to participate in Erasmus+ may engage in a number of development and networking activities, including strategic improvement of the professional skills of their staff, organisational capacity building, and creating transnational cooperative partnerships with organisations from other countries in order to produce innovative outputs or exchange best practices. There are 3 key-actions: KA1- Staff mobility, KA2 – Strategic partnerships and KA3 – Support for policy reform.
4. In the framework of OSOS project teachers can choose to apply to a KA1. Erasmus+ supports training activities abroad for professionals involved in pre-primary, primary and secondary school education. These opportunities can consist of structured courses or other events or job shadowing or observation periods at schools or other relevant organisations. The training activity must last a minimum of 2 days and cannot last more than 2 months (this excludes travelling time).
5. Teachers cannot apply directly for a grant as an individual. Applications must be made by schools or consortium coordinators on behalf of schools.
6. Learning mobility opportunities aim to encourage the mobility of students and teachers. The role of the organisations in this case schools is to organise these opportunities for individuals. The



benefits for the participating organisations equally include improve teaching and learning, expand pupils' horizons and raise their aspirations, provide unique professional development experiences for school staff, raise your school's profile, connect with stakeholders organisations, policymakers and the community.

Please note that the deadline for the submission of the application of KA1 in 2018 is February, 1<sup>st</sup> at 12h CET.

#### **Suggested readings**

EC portal of the funding programme <http://ec.europa.eu/education/>

Eramus+ programme guide available at

[https://ec.europa.eu/programmes/erasmus-plus/resources/programme-guide\\_en](https://ec.europa.eu/programmes/erasmus-plus/resources/programme-guide_en)

School education details available at

[https://ec.europa.eu/programmes/erasmus-plus/opportunities/school-education-0\\_en](https://ec.europa.eu/programmes/erasmus-plus/opportunities/school-education-0_en)

School education staff guide available at

[https://ec.europa.eu/programmes/erasmus-plus/school-education-staff\\_en](https://ec.europa.eu/programmes/erasmus-plus/school-education-staff_en)

Course catalogue at <http://www.erasmustrainingcourses.com>

School Education Gateway available at

[https://www.schooleducationgateway.eu/en/pub/teacher\\_academy/catalogue.cfm](https://www.schooleducationgateway.eu/en/pub/teacher_academy/catalogue.cfm)

EPALE – Adult Education <https://ec.europa.eu/epale/pt/home-page>

A practical guide for school leaders, Erasmus+

#### **4.3.2 Course II: Participatory exercises with young people (headmasters and teachers)**

The following exercises are intended for teachers, trainers and school leaders to engage with children and young people, discussing and exploring together their visions for managing change in school settings that takes into account the needs of local communities. The exercises are flexible enough to be used in a wide range of settings, for different specific purposes, and they can be applied to an indefinite range of subjects, issues or contexts.

The exercises are relatively flexible in terms of age groups: although some of the exercises are not suitable for small children, “simpler” exercises better suited to children can be adapted to older students (for instance, versions of the mapping tool, here recommended for children, were used with adult publics, e.g., at the Public Participation Laboratories organized by CVIVA, see <https://www.rri-tools.eu/how-to-stk-pm-implement-rri-at-national-level>). Versions of these exercises are commonly used in qualitative research and evaluation, helping researchers understand children, young people and families' ideas, expectations, concerns and visions for their communities, services or issues. In research contexts, these exercises are usually combined with more formal tools, e.g., observation, surveys or interviews.

The purpose of these exercises is of course different — instead of producing generalizable findings, for OSOS the goal is collaborating with the children and young people who will use and benefit most from the proposed interventions in schools and teaching. The level of richness and rigor that the social research techniques afford is therefore not needed. Still, the exercises can be combined or used one after the other, building up on the learning of the previous one, thus developing participants' empowerment and mobilization.

Before choosing which exercise(s) to use, a number of issues should be considered:

- What are the characteristics of the groups that you want to work with (age, level of literacy, skills with different media for expression, etc.)? Are the specific techniques appropriate for these groups?



- The exercises rely on using things of different origins, costs, characteristics – scraps of paper, recycled materials, discarded objects, etc. It is up to you what specific materials to use, depending in your budget and other constraints. Feel free to improvise, but do take into account that characteristics of the materials can be relevant and/or problematic in specific cultural and demographic settings. Be attentive to composition (e.g., leather), colours, safety of the materials, etc.
- Drawing, stories and similar approaches are usually enjoyable, and they help free expression. However, because of the freedom of expression that they allow, and depending on the subjects being discussed, there is some risk that these exercises raise personal and painful issues – bullying at school, losses, problems at home, etc. Be aware of this risk, and be prepared to address these issues.
- Who is the intended audience for the results of the exercises? Only the participants or also their families, school leaders and community authorities? How receptive will the different people be to non-conventional presentation methods? Will they expect written reports? Be prepared to commit some time to reporting to different publics after the exercises are completed.

The exercises can be more or less image based, depending on age and skills of participants; but visual materials illustrating the children’s point of view can be enriched with text. Be prepared to help with adding written comments to the visual materials; but also taking notes, and perhaps audio and/or video recording the exercises, including all the group and plenary discussions. All these will be handy and pertinent when reporting the exercise. The goal of these exercises is not obtaining publishable and generalizable findings. But the presentation of results and conclusions of the exercise shouldn’t be neglected. It is an essential part of the engagement process; it is absolutely necessary if these exercises are to be consequential, relevant to interventions in the school or community, which in itself is crucial to keep young people involved on the long run. This is not the place to elaborate on the presentation of results; but please do take a few general ideas into account:

- The presentation should be attractive and interesting not just to participants, but also to service providers, school leaders, community authorities and wider audiences which may be interested in the results.
- We suggest making extensive use of online media and social networks, as well as visual tools and interactive based approaches, to give immediate feedback to the participants of the exercise and other interested parts.
- Results should be freely available as soon as possible and for as long as possible.

### Course II - Training Activity 1: Participatory Mapping

#### **Framework**

Mapping can be used as an opening exercise to elicit and explore an indefinite range of ideas. Mapping allows young people to identify and discuss issues referring to more or less local contexts, helping uncovering matters of concern and interest, as well as possible solutions and suggestions. Different kinds of mapping are particularly useful to discuss how location based services — e.g. schools, classrooms, clubs, neighbourhoods, etc. — work. It helps participants examine their places in different ways and understand how these services are managed. Mapping can also be used to deal with non-spatial topics, for instance, to explore social relationships, or reflect about the experience with different objects, tools, institutions, etc., using mind maps or mapping social networks. It can also be useful to gain an understanding of children/young people points of view, as well as to get acquainted with their language, frames of reference, and even style of participation.



It is usually used to start more extensive dialogue and relationships, and if needed it may be followed up with other exercises.

Two broad strategies for mapping are suggested: free mapping and working on maps prepared by the organizers. The choice of strategies depends on the characteristics of the participants (age, preparation, experience with participatory exercises, level of involvement), purposes of the exercise, and subject being addressed:

- Free mapping is what the name says: participants are asked to draw and discuss (and annotate) whatever they want to reflect on. Free mapping is more exploratory, more bottom up; it works well when the organizers don't want to impose any predefined subject or matter of concern.
- Prepared maps constrain the exercise a bit more. Participants start with a map (of places, regions, networks, etc.), and are asked to complete it or annotate it according to the topic being discussed. Prepared maps help limiting the debate to a specific topic, and somewhat set its terms.

### **Aims**

- Identify and discuss issues referring to more or less local contexts, helping uncovering matters of concern and interest, as well as possible solutions and suggestions;
- Understand children's and young people points of view on a specific topic.

### **Before you start**

Time: at least 2 hours

Number of participants: 20 (recommended for students from 6 to 10 years old)

Space organisation: in groups of 4 participants

Materials: bellow depending on the strategy

### **Narrative**

For the free drawing or modelling, you will need materials for drawing and annotation; no special, cos materials are needed: blank paper (A3); markers; sticky dots or post-its.

1. Ask participants (individuals or in groups) to draw a building, place, region, etc., including any particular features they want to consider (using the dots/post-its).
2. Individual participants or a spokesperson of the group present the map and its features to the plenary.
3. Discuss the map and the particular features, noting where points of interest, tension, agreement, etc.

For the marking features on prepared maps you will need:

- Printed map of a location (cartographical, satellite image, architectural plan, etc.), or conceptual map (network, organigram, etc.)
- Materials for drawing and annotation (no special, costly materials are needed): markers and sticky dots, post-its.

1. Prepare a number of maps according to the topic being addressed.
2. Provide sticky dots/post-its of three colours.
3. Participants working in groups use the sticky dots/post-its to identify "good things", "bad things" (issues that need work, etc.) and "opportunities".
4. If there are too many dots/post-its, provide fresh prints to the groups.
5. Each group will select a spoke person to present their map with issues/opportunities to the plenary.



6. Make sure to take notes and/or record all the process, including the group and plenary discussions.

### **Suggested readings**

J. Corbett (2009) *Good practices in participatory mapping: A review prepared for the International Fund for Agricultural Development*, IFAD, available at: [http://www.ifad.org/pub/map/PM\\_web.pdf](http://www.ifad.org/pub/map/PM_web.pdf)

Pathways through Participation (2010) *Using participatory mapping to explore participation in three communities*, available at:

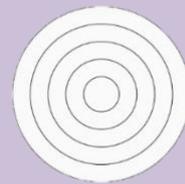
[http://pathwaysthroughparticipation.org.uk/wp-content/uploads/2009/09/Using-participatory-mapping-to-explore-participation-in-three-communities\\_June-2010.pdf](http://pathwaysthroughparticipation.org.uk/wp-content/uploads/2009/09/Using-participatory-mapping-to-explore-participation-in-three-communities_June-2010.pdf)

N. Emmel (2008), *Participatory Mapping: An innovative sociological method*, Real Life Methods/University of Leeds, available at <http://eprints.ncrm.ac.uk/540/>

## **Course II - Training Activity 2: Participatory Exercise “Targets”**

### **Framework**

Targets can be used to assess the level of agreement or disagreement with a given idea, issue, suggestion, initiative, and to prompt group discussion about them. It can also be used to debate personal preferences and preferred changes (e.g., in school, teaching, the classroom, etc.), to reflect about own or others position within a range of values that can be represented by a gradient: local/global; inward/outward, closed/open, traditional/innovative, etc.



This exercise is a visual alternative to the more classic “strongly agree” – “strongly disagree” question usually expressed in numbers; it is therefore more apt to use with young children.

### **Aims**

- Access the level of agreement or disagreement with a given idea, issue or suggestion;
- Understand children’s and young people points of view on a specific topic.

### **Before you start**

Time: at least 2 hours

Number of participants: 20 (recommended for students from 6 to 10 years old)

Space organisation: in groups of 4 participants

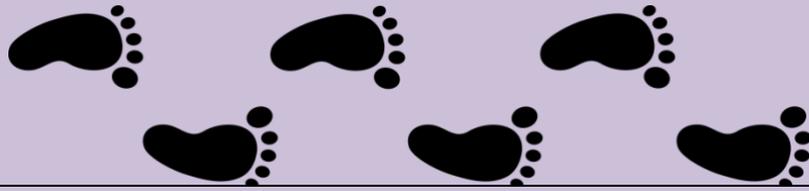
Materials:

- A3-A1 prints of a simple target (i.e., series of concentric lines) or blank paper;
- Markers and pens;
- Post-its;
- and prepared images relevant to the topic addressed.

### **Narrative**

1. Share the target prints by participants in groups (suggested: up to 5 people); alternatively, share the blank paper and ask them to draw a target as they wish.
2. Agree on the topic that you wish to address and on how the board should represent it. What should the innermost/outermost circles represent? E.g., if representing the level of agreement/disagreement with something, the innermost circle represents strong agreement, the outermost strong disagreement.
3. Ask participants to place Post-its on the target; post-its can also be used to describe or comment on the position. Alternatively, participants can draw on the target or use prepared images pertinent to the topic being addressed.
4. A spoke person of each group presents their target to the plenary for discussion.
5. Don’t forget to take photos of each target!

## Course II - Training Activity 3: Participatory Exercise “Journeys”



### **Framework**

Journeys is a very simple participatory time-line. Participants are invited to identify their personal aspirations and goals on any given topic and draw the path towards that goal, including any obstacles that they may encounter. It can also be used to represent and explore expectations for new services, activities, institutions, etc., allowing for reflection on the subject’s actions related with these developments. As a visual tool, Journeys is well suited for children of all ages. This particular metaphor (a path towards a goal) can be adapted to other images more familiar and/or relevant to specific age groups or cultural contexts: a football goal; a basketball net;

### **Aims**

- Identify a personal aspiration and goal on a specific topic;
- Draw a path towards that goal including possible obstacles they may encounter;
- Understand children’s and young people points of view on a specific topic.

### **Before you start**

Time: at least 2 hours

Number of participants: 20 (recommended for students from 11 to 16 years old)

Space organisation: in groups of 4 participants

Materials:

- Roll of white paper (standard 1m x 10m should be enough);
- Enough cut-outs of feet (or football boots, etc.) for all participants;
- Markers;
- Blue Tac.

### **Narrative**

1. Roll out a large section of the paper on the floor. Draw a path on it.
2. Ask participants to identify goals they want to achieve or expectations about any issue at stake. Ask them to draw images representing these goals/expectations at one end of the path.
3. Participants place footprints on the path with Blue Tac. Each footprint represents a step towards the goal that they should identify by writing it down on the footprint. Footprints should be placed in a logical sequence.
4. Participants can draw potential obstacles, diversions, etc. These too should be identified and explained.

### **Suggested reading**

Adapted from “Journeys” in Angus McCabe and Katrice Horsley (2008) *The Evaluator’s Cookbook: Exercises for participatory evaluation with children and young people*, Routledge, p.43.

## Course II - Training Activity 4: Participatory exercise “Scale - Pros & Cons”

### **Framework**

This participatory exercise features a simple visual device that helps organizing group exploration of opposing views on a given subject. It can be useful to discuss controversial topics, to evaluate any change being considered (e.g., at school), to analyze innovations occurring in science or society, etc. This exercise is particularly interesting since it forces participants to consider and work on different views on any particular subject, even those that may be contrary to their own. The structured



clashing of ideas that the device thus promotes can be help not just identifying problems but also formulating interesting improvements and solutions.

#### **Aims**

- Discuss controversial topics to evaluate any change being considered;
- Force participants to consider and work on different views on any particular subject;
- Understand children's and young people points of view on a specific topic.

#### **Before you start**

Time: at least 2 hours

Number of participants: 20 (recommended for students from 11 to 16 years old)

Space organisation: in groups of 4 participants

Materials: A3 sheets with printed old fashion scales; pens or markers.

#### **Narrative**

1. Choose a subject to address with the participants: a feature of the school environment, a particular innovation, a policy measure being considered, etc.
2. In groups, ask participants to draw and/or write the positive aspects of the subject being addressed on one dish of the scale. Take note of the groups discussions leading to the choice of the positive aspects.
3. Ask participants to draw and/or write the negative aspects on the other dish of the scale. Take note of the group discussions.
4. A spoke-person of each group presents the positive and negative aspects to the plenary.
5. Discuss.

#### **Suggested reading**

Adapted from "Scale" in Angus McCabe and Katrice Horsley (2008) *The Evaluator's Cookbook: Exercises for participatory evaluation with children and young people*, Routledge.

### **4.3.3 Course III: Introducing innovation in your school (teachers)**

The idea of learning as a one-way process, in which an active agent (teacher) transmits information to passive agents (students) has to stay in the past for good. It is unquestionable that science education should be renewed, with the implementation of inquiry-based education methods, as several European initiatives have been pursuing. Learning science through inquiry improves students' understanding, participation and motivation in relation to scientific activities and contributes to improve the general interest in learning.

#### **Course III - Training Activity 1: From Hands-On to IBSE Activities**

#### **Framework**

Teaching science through experimentation is a goal that every science teacher should pursue. Nevertheless it is quite common to find experimentation as synonym of protocol-based and laboratory-based activities. Although hands-on activities are very important to increase students' understanding of science and their enthusiasm with the scientific process, care should be taken to not have students involved in activities where they perform a step-by-step procedure, without being intellectually engaged with the scientific phenomena they are observing.

#### **Aims**

- To discuss the importance of inquiry when teaching science;
- To understand the IBSE (Inquiry-Based Science Education) methodology;
- To discuss the difference between hands-on activities and inquiry-based activities.

#### **Before you start**

Time: 3 hours

Number of participants: Up to 20

Space organization: Meeting room with tables forming small groups (up to 5 teachers each group)



**Materials:**

- Laptop; Projector; Black markers; Tape.
- A3 or A2 papers, where teachers will describe hands-on and IBSE activities;
- Sets of IBSE cards, each one with one of the 5-E steps: Engage, Explore, Explain, Extend, Evaluate;

**Narrative**

1. Start with a short presentation of each participant and moderator.
2. Explain the purpose of the training activity.
3. Introduce the importance of developing experimental activities as a strategy to engage students in the learning process.
4. Discuss with teachers the major advantages and limitations of hands-on activities.
5. Introduce IBSE as a method that takes students from a hands-on to a minds-on context.
6. Explain the 5-E model that can be followed when applying IBSE: Engage, Explore, Explain, Extend and Evaluate.
7. Discuss with teachers how a hands-on activity can be transformed in a IBSE activity.
8. Discuss with teachers the major advantages and limitations of IBSE activities.

**Suggested reading**

<http://www.eesc.europa.eu/sites/default/files/resources/docs/rapportrocardfinal.pdf>

**Course III - Training Activity 2: Designing IBSE Activities****Framework**

It is very important to help teachers understanding how inquiry-based learning can be applied in science classes, as this is not a linear process. Teaching science through inquiry implies to shift the roles of teachers and students from a unidirectional to a multidirectional process. Students must be placed as active agents, where their critical thinking, problem-solving and collaboration skills are triggered. This is not an easy step for teachers, as many times they are afraid of losing the control of the learning process, but it is not an easy step for students also, as they are not used to have autonomy and their voices heard in the classroom context.

**Aims**

- To discuss the importance of inquiry when teaching science;
- To discuss how a hands-on activity can be transformed in an IBSE activity;
- To identify IBSE activities to be applied in the classroom context;
- To design, from scratch, IBSE activities following the 5-E model: Engage, Explore, Explain, Extend and Evaluate.

**Before you start**

Time: 3 hours

Number of participants: Up to 20

Space organization: Meeting room with tables forming small groups (up to 5 teachers each group)

**Materials:**

- Laptop;
- Projector;
- A3 or A2 papers, where teachers will design IBSE activities;
- Sets of IBSE cards, each one with one of the 5-E steps: Engage, Explore, Explain, Extend, Evaluate;
- Black markers;
- Tape.

**Narrative**

1. Start with a short presentation of each participant and moderator.
2. Explain the purpose of the training activity.
3. Introduce the importance of engaging students in an inquiry process when learning science.



4. Ask teachers to identify several hands-on activities, linked with different scientific topics.
5. Ask teachers to work in small groups to discuss how to transform the hands-on activities into IBSE activities, following the 5-E model.
6. Promote a discussion among the teachers' groups about the designed IBSE activities.
7. Discuss with teachers the major advantages and limitations of applying these particular IBSE activities in their classroom context.

### Course III - Training Activity 3: Going Beyond School Walls

#### **Framework**

Since one of the major challenges in science education is making students understand the importance of science and how science is connected with the world and their daily lives, it is of great importance to promote science classes that are not limited by the classroom walls nor stuck in the science textbooks. Taking science learning beyond the school walls is a major step to engage students with science, scientists and the scientific process. Teachers must be encouraged to explore nearby areas, as gardens but also community services, scientific institutions, museums and science centres, to help students make sense of science in their own social context.

#### **Aims**

- To discuss the importance of LOtC (Learning Outside the Classroom) spaces in the process of science learning;
- To help teachers identifying areas, institutions and services nearby the school, that can be used to link science from the textbooks with students' daily lives;
- To discuss with teachers how to take an IBSE activity outside the school walls;
- To help teachers design new lesson plans, within diverse scientific topics, which follow IBSE and are applied outside the school walls.

#### **Before you start**

Time: 3 hours

Number of participants: Up to 20

Space organization: Meeting room with tables forming small groups (up to 5 teachers each group). Ideally, this training activity should be developed in a school and the nearby spaces should be explored during the activity.

Materials:

- Laptop; Projector; Black markers; Tape.
- A3 or A2 papers, where teachers will design lesson plans following IBSE and taking place outside the classroom;
- Sets of IBSE cards, each one with one of the 5-E steps: Engage, Explore, Explain, Extend, Evaluate;

#### **Narrative**

1. Start with a short presentation of each participant and moderator.
2. Explain the purpose of the training activity.
3. Promote a discussion with teachers about which outdoor areas they identify nearby their schools, where science learning could happen (ideally, teachers should explore the nearby area of the venue, as an exercise to identify LOtC spaces).
4. Ask teachers to identify two sets of scientific topics from the school curricula: 1. that can be explored outside the school walls; 2. that cannot be explored outside the school walls.
5. Ask teachers to work in small groups to discuss how to develop lesson plans about the first set of scientific topics following IBSE and explored outside the school.
6. Promote a discussion among the teachers' groups about the designed lesson plans.
7. Ask teachers again to work in small groups, this time to discuss how to develop lesson plans about the second set of scientific topics following IBSE and explored outside the school.
8. Promote a discussion among the teachers' groups about the designed lesson plans.



9. Discuss with teachers the major advantages and limitations of taking science learning outside the school walls.

**Suggested reading**

<http://www.lotc.org.uk/wp-content/uploads/2011/03/G1.-LOtC-Manifesto.pdf>

**Course III - Training Activity 4: From Interested Students to Active Citizens**

**Framework**

Every single adult should act as an interested, informed and active citizen, taking his/her decisions fully aware of what is at stake. But for this to happen there is a long way to go, which starts right at school. A full investment must be made in pedagogical approaches that increase students' critical thinking, team building, collaboration, problem solving and creativity, encourage them to see themselves as full-right citizens, with a voice to be heard. A strong link between what is learned in school and the local community is the first step to start transforming students in active citizens.

**Aims**

- To discuss the importance of placing students as active citizens within their community;
- To help teachers identifying topics in the school curricula that can be used to engage students as active citizens;
- To help teachers developing short-term projects, linked with the school curricula, that engage students with their community and with local stakeholders;
- To help teachers identifying stakeholders within the local community that can be involved in the short-term projects.

**Before you start**

Time: 3 hours

Number of participants: Up to 20

Space organization: Meeting room with tables forming small groups (up to 5 teachers each group)

Materials:

- Laptop; Projector; Black markers;Tape.
- A3 or A2 papers, where teachers will design short-term project that engage students with the local community;

**Narrative**

1. Start with a short presentation of each participant and moderator.
2. Explain the purpose of the training activity.
3. Ask teachers to identify topics from the school curricula that can be converted in short term-projects that place students as active citizens in the centre of their community.
4. Promote a discussion with teachers about which stakeholders could be involved in school short-term projects, considering their own school context.
5. Ask teachers to work in small groups to discuss how to develop short-term projects that place students as active citizens in the centre of their community, where they should identify the topics to be explored, the stakeholders to be involved and the general action plan.
6. Promote a discussion among the teachers' groups about the designed short-term projects.
7. Discuss with teachers the major advantages and limitations of developing school project that engage students in citizenship actions.

**Suggested readings**

[http://www.communityschools.org/assets/1/AssetManager/CBL\\_Book\\_1\\_27\\_06.pdf](http://www.communityschools.org/assets/1/AssetManager/CBL_Book_1_27_06.pdf)

**4.3.4 Course IV - Introducing RRI in Schools (headmasters and teachers)**

The complex challenges that society faces (see Societal Challenges - The EU Framework Programme for Research and Innovation) demand complex solutions: this is the main assumption behind Responsible Research and Innovation (RRI), a new framework for the governance of science and



technology. It is a main tenet of the RRI framework that these challenges have to be tackled by aligning the values, needs and expectations of the multiple actors involved in research and innovation: policy makers, the research community, business and industry, civil society organisations and, of course, the education community.

In education, RRI means that the multiple stakeholders involved in formal learning should develop strategies linking teaching and learning with wider societal goals and implement science education for responsible citizenship. More precisely, education inspired by RRI inspires the adoption of an inquiry approach to science, starting with the practice of research and innovation itself. Learners across the school years will develop the skills to critically analyse science and technology developments and anticipate its impacts, contributing to debates on emerging issues. Moreover, learning activities will invite students to work on solutions to societal challenges, take into account the responses of all parts and consider their values, expectations and concerns.

<b>Course IV - Training Activity 1: Self-Reflection Exercise</b>
<p><b>Framework</b></p> <p>This activity is based on the “<i>Self-Reflection Tool</i>” template developed by the RRI Tools project. This will help thinking on RRI principles that can improve your teaching practice and your school learning environment. The tool will guide your reflection by providing questions organised according to the key RRI issues, or policy agendas: ethics, gender equality, governance, open access, public engagement and science education. The questions and sample answers will help you consider all relevant stakeholder groups (policy makers, civil society organisations, industry and business, researcher and, of course, the education community). The tool shouldn’t be treated as an evaluation, but rather as a structured exercise for reflecting and learning. Also, it doesn’t need to be exhaustive; indeed, for this activity we suggest that only one policy agenda should be selected for reflection and work on the questions most relevant for your context.</p>
<p><b>Aims</b></p> <ul style="list-style-type: none"> <li>▪ To become familiar with basic RRI principles, by structured reflection on key questions, both individually and with colleagues.</li> </ul>
<p><b>Before you start</b></p> <p>Time: 2 hours</p> <p>Number of participants: 6, Space organisation: meeting room set-up</p> <p>Materials: Laptop; Projector; Blank paper, pens; Prints of the “RRI Self Reflection Tool”; RRI Self Reflection Tool (2016). RRI Tools.</p>
<p><b>Narrative</b></p> <ol style="list-style-type: none"> <li>1. Start with a short presentation of each participant and moderator.</li> <li>2. Explain the purpose of the training activity;</li> <li>3. Sometime before the session, share with the participants the video “RRI for Education Community”, RRI for education Community (2015). RRI Tools: <a href="https://www.youtube.com/watch?v=3kDGaNNC6PE">https://www.youtube.com/watch?v=3kDGaNNC6PE</a></li> <li>4. Individually, ask participants to fill in the “RRI Self Reflection Tool”</li> <li>5. Encouraged participants to take notes from the self-reflection – issues, remarks, suggestions that may arise that can be taken up in the next step.</li> <li>6. Ask the group to debate professional practices at school level in light of what participants uncovered with the self-reflection tool. The RRI Tools team recommends a few guiding questions (that should be visible during the session): <ul style="list-style-type: none"> <li>▪ What does RRI mean to me and to my context?</li> <li>▪ What relevant aspects to my work are already being taken into consideration?</li> <li>▪ Which relevant aspects need more reflection and consideration?</li> <li>▪ In which kind of activity or event could I integrate RRI dimensions and how?</li> <li>▪ How do I see my school collaborating with other stakeholders?</li> </ul> </li> </ol>



- Which stakeholders would I consider collaborating with (families, museums, policy makers, researchers, local business, etc.)?
- What do these practices have to do with my school values, programme, objectives, etc.?

### **Suggested readings**

RRI in practice for schools. Handbook for teachers (2016). RRI Tools

<https://www.rri-tools.eu/documents/10184/29511/RRI+in+practice+for+schools.+Handbook+for+teachers>

How to integrate RRI in secondary education (2016). RRI Tools.

<https://www.rri-tools.eu/how-to-stk-ec-integrate-rri-in-secondary-education>

How to Introduce RRI at school through project- and inquiry-based learning in STEM (2016). RRI Tools.

<https://www.rri-tools.eu/how-to-stk-ec-introduce-rri-at-school-through-project-and-inquiry-based-learning-in-stem>

RRI Self Reflection Tool (2016). RRI Tools.

<https://www.rri-tools.eu/documents/10184/265698/SRT-BlankSheet/56970b0c-49a4-401a-b69b-7ff4ea7fcf74>);

## **Course IV - Training Activity 2: RRI Obstacles & Opportunities Map in our School**

### **Framework**

This activity is based on an exercise developed by the RRI Tools as a crucial initial step to implement RRI ideas. In what extent RRI and its processes can and should inspire STEM education? Participants will be invited to reflect on the characteristics, main barriers and opportunities related to the implementation of RRI principles at school or in classroom activities. Participants in the activity should have completed the self-reflection exercise (Training activity 1).

### **Aims**

- To become familiar with basic RRI principles, by examining how they can be implemented in specific school settings;
- To identify opportunities and barriers to the implementation of RRI in the school community and therefore, to the development of the open schooling hub.

### **Before you start**

Time: 1h (it can be more depending on the number of participants)

Number of participants: 20, in groups of 4-5

Space organisation: meeting room set-up; tables that can be arranged for groups

Materials: Laptop; Projector; Red and green cards: at least 3 each colours per group; Blank paper, pens.

### **Narrative**

1. Start with a short presentation of each participant and moderator.
2. Explain the purpose of the training activity.
3. Sometime before the session, share with the participants the video “RRI for Education Community” and invite participants to consult sections 1.1 and 2.1 of the guide RRI in practice for schools. Handbook for teachers (2016). RRI Tools.

RRI for education Community (2015). RRI Tools

<https://www.youtube.com/watch?v=3kDGaNNC6PE>

4. In groups of 4-5, ask participants to reflect on specific obstacles and opportunities of RRI processes in the school.
5. Each group should write at least 3 obstacles in different red cards and 3 opportunities in different green cards.
6. Stick cards on a flipchart, organised by obstacles and opportunities, by subjects or by stakeholders involved.



7. Ask a designated representative of each group to briefly (2 minutes) present to the plenary the group identified opportunities and obstacles to the plenary.
8. The plenary discusses the obstacles and opportunities map.

**Suggested readings**

RRI in practice for schools. Handbook for teachers (2016). RRI Tools

<https://www.rri-tools.eu/documents/10184/29511/RRI+in+practice+for+schools.+Handbook+for+teachers>

How to Introduce RRI at school through project- and inquiry-based learning in STEM (2016). RRI Tools.

<https://www.rri-tools.eu/how-to-stk-ec-introduce-rri-at-school-through-project-and-inquiry-based-learning-in-stem>

**4.3.5 Course V: Engaging with Families (headmasters, teachers and parents associations)**

Several research studies suggest that effective parental engagement in school is important to motivate students towards science and promote school success. Thus, it is desirable to achieve a higher level of collaboration and commitment with families, searching for a proactive rather than reactive participation. Moreover, it should be sensitive to the circumstances of all families, recognize the contributions parents can make irrespectively of their socioeconomic status, and aim to empower them.

**Course V - Training Activity 1: Parent Involvement Challenges**

**Framework**

Every parent wants the best for their children but participate in school is difficult to promote and maintain. This does not mean that parents are not interested or not involved in supporting their children's learning. It may mean that some parents find it difficult to be involved in the life of the setting. Therefore, it is important to consider what barriers to school involvement and participation parents may face in becoming involved in their children’s learning and how practitioners can address these challenges to support parents more effectively.

**Aims**

- To raise awareness to the role of effective family engagement in the learning process;
- To access the level of family involvement/engagement in school projects and initiatives;
- To identify the main constrains to families’ involvement/engagement;
- To help teachers identifying strategies to overcome some of the main identified constrains.

**Before you start**

Time: 3 hours. Number of participants: Up to 20

Space organization: Meeting room with tables forming small groups (up to 5 teachers each group).

Materials: Laptop; Projector; Black markers; Tape ; A3 or A2 papers, where teachers will identify challenges and define strategies to solve them;

**Narrative**

1. Start with a short presentation of each participant and moderator.
2. Explain the purpose of the training activity.
3. Ask teachers to work in small groups (up to 5) and reflect on the following questions:
  - What do you understand by the terms “effective family involvement” and “family engagement”?
  - How successful do you think family involvement/engagement works in your school? Can you give some examples?



<ul style="list-style-type: none"> <li>▪ What would you consider to be the main benefits of families getting involved/engaged? Considering the children, families, and school, write and discuss the main topics considering children, families, and school.</li> <li>▪ What evaluation methods are you using to demonstrate that family participation is improving the learning process?</li> </ul> <p>4. Considering each school parents' community, ask teachers to identify and to make a list of the main constrains for successful parent involvement/engagement (consider physical, language, cultural, emotional and time barriers).</p> <p>5. Promote a discussion among teachers about the identified constrains: Did teachers identified the same constrains? Are any of the identified constrains linked to the school context?</p> <p>6. Ask teachers to choose among the identified constrains a list of key-challenges that are more difficult to address.</p> <p>7. Again in small groups, ask teachers to work on one or two of the key-challenges previously identified in order to find solutions to promote family engagement.</p> <p>8. Discuss with teachers what changes could be made to overcome the challenges and promote family engagement. Consider the following reflective questions:</p> <ul style="list-style-type: none"> <li>▪ In what ways are all parents given the opportunity to contribute?</li> <li>▪ How are parents made aware that they can they can contribute in many different ways – such as text, email, phone, leaving comments and suggestions at the school or setting, as well as through meetings?</li> <li>▪ Are parents allowed to contribute to their child personal learning plan (e.g. outcomes for learning that are the most important to them, activities plan).</li> <li>▪ Are parents involved in this process in ways that are accessible and inclusive?</li> </ul>
--

<p><b>Course V - Training Activity 2: Getting to Know School Families</b></p>
<p><b><u>Framework</u></b></p> <p>It is important to make sure that all families have the opportunity to be involved in their children's learning and education. Families, like students, are diverse. Therefore it is important to guarantee an effective inclusive practice, and that all barriers to family engagement are removed. It is also important to consider inclusion and equality as key element in a school environment.</p>
<p><b><u>Aims</u></b></p> <ul style="list-style-type: none"> <li>▪ To reflect on the diversity of family communities;</li> <li>▪ To discuss and help teachers to identify among the family communities profiles, skills and experiences they could offer;</li> <li>▪ Help teachers to identify strategies on how to engage the different strands, including the involvement of ethnic and cultural minorities, parents with lower educational status and other cultural specificities.</li> </ul>
<p><b><u>Before you start</u></b></p> <p>Time: 3 hours, Number of participants: Up to 20</p> <p>Space organization: meeting room with tables forming small groups (up to 5 teachers each group).</p> <p>Materials: Laptop; Projector; Black markers; Tape; A3 or A2 papers, where teachers will characterize the diversity of families;</p>
<p><b><u>Narrative</u></b></p> <ol style="list-style-type: none"> <li>1. Start with a short presentation of each participant and moderator.</li> <li>2. Explain the purpose of the training activity.</li> <li>3. Ask teachers to generally characterize the diversity of families in their schools, concerning differences in:             <ol style="list-style-type: none"> <li>a. Nationality</li> <li>b. Educational status</li> <li>c. Career</li> </ol> </li> </ol>



- d. Socioeconomic background
- e. Geographic diversity (e.g. rural vs. urban, different country origins)
- f. Cultural-relate issues (e.g. religion, travelling families, migration status)
- g. Family composition (e.g. single parents, nuclear families, grandparent families)

List it on a summarized way a paper;

4. Ask teachers to briefly explain the characterization of their school families.
5. Ask teachers to switch papers among them in order to work on their peer's families' characterization.
6. Considering the description, they have now in hands, ask teachers to identify ways of engaging each type of family in school activities (consider profiles, skills and experience they could offer).
7. Ask teachers to share with the group the identified strategies to engage families and to refer also to possible constrains.
8. Promote a discussion among teachers about the designed strategies.

## 4.4 OSOS support activities

### 4.4.1 Workshops and events

Being part of a network will encourage interaction and will provide schools with opportunities to enrich their practices and professional context through cooperation within and between schools, universities, science centres and museums, local industry and research institutions, collaborative reflection, development and evaluation of instruction, exchange of ideas, materials and experiences, quality development, cooperation between teachers, students, parents, science communicators, local entrepreneurs and researchers. In this way it is expected that it will extend the “dialogue” between scientists and the educational community, will enforce the collaboration between schools and research organisations (using the Open Schooling Hubs as a catalyst), will promote scientific culture in society and will help young people to acquire a better understanding of the role of science and technology in society.

The development of the virtual learning community section will be enhanced by the Open Schooling Hub Community Support Environment that will provide tools for community building and support. The consortium will organise Open Schooling Days for head-teachers, principals and teachers in the partner countries in order to engage them in the open schooling hub approach and share the ready to be used project activities for the students and thematic events at local and national level to raise the interest and awareness of students in science, research and innovation, to engage them in STEM through the project educational activities in order to engage them in the variety of future career opportunities in STEM.

Building teacher and leader capacity is vital to successful transformation. The project will expand opportunities for teachers' professional development, including occasions to interact with working scientists, interactive seminars for teachers and educators, educational contests, workshops and training seminars to help them to introduce innovative practices in their classroom environment.

By offering teachers a repertoire of activities and applications, along with a detailed school-based framework for their effective introduction in the school practice, the proposed coordination action will empower school authorities and teachers not only to change their teaching practice and introduce contemporary scientific and societal issues and debates in their lessons, but also to propose and initiate the necessary changes in their schools, to allow for a more seamless introduction of innovation cultures and attitudes. Moreover, the head-teachers, school principals and teachers who will participate in the project will be encouraged to become innovative curriculum developers themselves and active change agents validating thus the proposed approach and methods.

The OSOS partners are investing significant effort supporting these communities by providing solutions and ideas on how the proposed activities could be integrated in existing curricula and taking into



account local circumstances, cultures and attitudes. Through a series of introductory participatory engagement and professional development activities OSOS will support head-teachers and teachers during the implementation phase while at the same time will develop a mechanism that will sustain the use of the project outcomes after the end of the project.

Furthermore, OSOS will provide services allowing and guiding the teachers to participate in a dynamically expanded collaborative network of School/thematic/national/international communities. These communities will be internally and flexibly structured and organized based on the activities and the content that each community implements/uses/publishes in open or private mode and allow the teachers to organize their groups or classrooms in terms of students and content, learning scenarios, and tools.

Using these tools, schools will be supported to build and organize their own profile and workspace in the platform and to support different users' involvement under their school communities and professional development. These tools are considered as distinct components "added" under each community created in the platform, in relevance to the learning concept/discipline/context they are designed by their managers/creators.

In addition, the OSOS support mechanism will develop Guidelines and Support materials for teachers and students that are expected to act as an implementation guide for the project's pilots in schools. They will include indicative Open Schooling projects and initiatives, easy guides for the use of the OSOS Incubators that bring the RRI framework in schools, the philosophy of community building mechanisms and the main characteristics of the OSOS open learning network that supports collaboration between schools, families, communities, industry and research. The materials will be available in conventional and electronic format.

#### **4.4.2 Summer schools**

In the framework of the project some learning mobility opportunities will be encouraged for teachers. The main goals for such an educational experience are to improve teaching and learning, expand pupils' horizons and raise their aspirations, provide unique professional development experiences for school staff raise your school's profile, connect with stakeholder's organisations, policymakers and the community. Summer courses can be excellent opportunities, but knowing what to expect will save a lot of time ensuring a successful educational experience.

The aim of OSOS Summer Courses will be to support the modernisation of science education and training focusing on the development of community-based learning projects, to assess the learning outcomes and the professional development of teachers, as well as to introduce Responsible Research and Innovation and Inquiry Based approach in science curricula.

The project will ensure two Summer Courses in 2018 and 2019 introducing to teachers how to work with OSOS platform taking the most advantage of the resources available online under OSOS support mechanism for schools as well as improving teachers' skills on what concerns the presentation of inquiry-based science teaching techniques. These tools will facilitate the engagement of students into science topics, in order to acquire scientific inquiry skills and experience the culture of making by doing by undertaking active, guided, experimentation, carried out in renown scientific facilities and research centres.

The OSOS partnership will organise a series of in-service training seminars (for teachers, museum educators, outreach groups and teachers' trainers involved in the project) under the framework of the ERASMUS+ Action in the form of Winter and/or Summer Schools. The expenses of the realisation of these activities will be covered from the grants that the participants could receive from their National Agencies. The aim of the consortium is to try to organise at least three teachers training



seminars/workshops within the project's lifetime. The work is expected to be enhanced by the Open Schooling Hub Community Support Environment that will provide tools for community building and support.

#### **4.4.3 Contests**

Education and competition are two universal ingredients of all human cultures and is not surprising the intimately relationship between them. It is natural for children to compete and, therefore, understandable that competition is put to educational use (Verhoeff, 1997).

The main reason to compete is that you learn a great deal by participating in a competition. A competition is also a great setting to learn in, failure does not bear any severe consequences.

On another perspective, many students feel it is difficult to express their talents in school. Exams do not always capture students' skills or accurately measure the ability to apply skills to real-world problems. In contrast, many student competitions are based on solving "real" cases and problems.

By participating in a competition, students, and also teachers, have the opportunity to show their skills. In turn, the rewards of such contests can help them achieve their educational and professional goals. To foster the participation of students and teachers in OSOS courses, events or other initiatives, some competitions will be available to expand the project on larger scale.

These competitions will be published later on the official website of the project as well as for databases of teachers and students at European level. The contests will have its own regulation allowing the development of scientific, social and interpersonal skills in students and teachers.

National and international contests for teachers and students will be organised in the framework of the project to effectively support the widespread of the proposed activities in the participating countries and beyond. In the framework of these contests, special events will be organized so that the participating teachers can demonstrate their efforts.

## 5 Conclusions

Community-based learning is a very important approach considering the involvement of learners. By putting them in the centre of the learning process we are contributing clearly to a more meaningful apprenticeship.

The connection to places that offer the opportunity to learn deeply about a specific topic and in an interdisciplinary manner creates a bridge between the classroom and students' lives enriching how students learn. Teachers should be encouraged to take students beyond the school walls where they can engage with real problems and challenges pushing them to apply their knowledge and skills.

The main focus of this deliverable is catering for the distinct difference regarding the level of openness of participating schools. More specifically, how the OSOS project and in particular the open schooling support mechanism can support different schools with different realities.

One thing is for sure: every school will have a place in OSOS project! No matter the background, and regardless their level of openness, students should definitely be in the centre of the learning process in direct contact with their local community having an active role in the identification of problems and possible solutions of the community.

A set of tools, resources and training activities will be available in OSOS platform to face different school needs. These tools will enhance the connections within the community and the sharing of experiences, materials and best practices to help teachers to go the extra mile.



## 6 References

- Ananiadou K, Claro M (2009). 21st Century Skills and Competences for New Millennium Learners in OECD Countries. OECD Education Working Papers, No. 41. OECD Publishing.
- Barrow L (2006) A brief history of inquiry: from dewey to standards. *Journal of Science Teacher Education* 17: 265–278.
- Bell T, Urhahne D, Schanze S, Ploetzner R (2010) Collaborative inquiry learning: models, tools, and challenges. *International Journal of Science Education* 32(3): 349-377. doi: 10.1080/09500690802582241.
- Bybee RW (2009) The BSCS 5E instructional model and 21st century skills. The National Academies Board on Science Education, Washington DC, 24 pp.
- Dillon J (2015) Innovation in out-of-school science. *School Science Review*, 97(358): 57-62.
- DGRI, European Commission (2015). Science education for responsible citizenship. Report to the European Commission of the expert group on science education.
- Duschl RA, Grandy RE (2008) Teaching scientific inquiry. Recommendations for Research and Implementation. Rotterdam: Sense Publishers.
- Engeln K, Mikelskis-Seifert S, Euler M (2013) Inquiry-based mathematics and science education across Europe: a synopsis of various approaches and their potentials. Topics and trends in current science education. Volume 1 of the series Contributions from Science Education Research, pp 229-242.
- European Commission Report / Eurydice (2011): *Science education in Europe: national policies, and research*.
- Glowa L, Goodell J (2016). Student-Centered Learning: Functional Requirements for Integrated Systems to Optimize Learning. International Association for K-12 Online Learning (iNACOL), 10 pp.
- Goodall J, Montgomery C (2014). Parental involvement to parental engagement: a continuum. *Educational Review*, 66(4): 399-410.
- Hooper-Greenhill E (2004). Measuring learning outcomes in museums, archives and libraries: The Learning Impact Research Project (LIRP). *International Journal of Heritage Studies* 10 (2): 151-174.
- Hooper-Greenhill E (2007). *Museums and Education: Purpose, Pedagogy, Performance*. Routledge, 231 pp.
- Johnson, L., Adams Becker, S., Estrada, V., and Freeman, A. (2015). *NMC Horizon Report: 2015 K-12 Edition*. Austin, Texas: The New Media Consortium
- Kapelari S (2015) *Garden learning: a study on European botanic gardens' collaborative learning processes*. London, UK: Ubiquity Press.
- King H, Dillon J (2012) Learning in Informal Settings. *Encyclopedia of the Sciences of Learning*, pp 1905-1908.
- LaRocque M, Kleiman I, Darling S (2011). Parental Involvement: The Missing Link in School Achievement. *Preventing School Failure: Alternative Education for Children and Youth*, 55(3): 115-122.
- Learning Outside the Classroom Manifesto (2006) DfES Publications, 04232-2006DOM-EN. Nottingham, UK. 24 pp.
- Lyons T (2006) Different countries, same science classes: students' experiences of school science in their own words. *International Journal of Science Education* 28(6): 591-613.



- Melville A, Berg AC, Blank MJ (2006) Community-based learning: engaging students for success and citizenship. Coalition for Community Schools, Institute for Educational Leadership. 68 pp.
- Organisation for Economic Co-operation and Development (2005). Annual Report.
- Osborne J, Dillon J (2008) Science education in Europe: critical reflections. A report to the Nuffield Foundation. King's College London. 32 pp.
- Osborne J (2013) The 21st century challenge for science education: assessing scientific reasoning. *Thinking Skills and Creativity* 10(0): 265-279.
- Rickinson M, Dillon J, Teamey K, Morris M, Choi M, Sanders D, Benefield P (2004). A review of research on outdoor learning. National Foundation for Educational Research and King's College London.
- Rocard M, Csermely P, Jorde D, Lenzen D, Walberg-Henriksson H, Hemmo V (2007) Science education now: a renewed pedagogy for the future of Europe. European Commission EUR22845. 29 pp.
- SEEF Good Practice Guide (2011) Making the most of your school grounds. Swansea Environmental Education Forum. 50 pp.
- Smith GA, Sobel D (2010). Place- and community-based education in schools. Routledge Ed., 184 pp.
- Sobel D (2005) Place-based education: Connecting classrooms and communities. The Orion Society Ed., 2nd edition, 96 pp.
- Verhoeff, T (1997). The role of competitions in Education.
- Wyner Y (2013) A conceptual model for teaching the relationship of daily life and human environmental impact to ecological function. *International Journal of Environmental & Science Education*, 8: 561-586.

